VI. *An Investigation on the Variability of the Human Skeleton: with especial reference to the Naqada Race discovered by Professor* Flinders Petrie *in his Explorations in Egypt.*

By Ernest Warren, *B.Sc. University College, London.*

Communicated by W. F. R. Weldon, *F.R.S.*

Received April 2,—Read June 3, 1897.

[Plate 22.]

The present investigation was undertaken for the purpose of obtaining some insight into the variability and mutual relationships of certain parts of the human skeleton. To work at such a problem is only possible under the rarest circumstances, for the material must be at least fairly homogeneous and in far larger quantity than is ordinarily obtainable.

The valuable material with which I worked consisted of an extensive collection of skeletons belonging to the "New Race."

The race so-named has recently been discovered by Professor Flinders Petrie in his explorations in Egypt, and, in his opinion, we have here "a branch of the same Libyan race that founded the Ammonite power." The period ascribed to the New Race lies between 3000 and 4000 b.c.

In discussing my measurements I considered it expedient to give some idea of the more obvious ethnological characters which the material exhibited, but it must be clearly understood that this side of the subject was not the primary object of my investigation.

The skeletons were disinterred from an ancient burial-ground covering a very extensive area, and including several thousand graves. It was situated in the district between Ballas and Naqada, some 30 miles north of Thebes, and on the west side of the Nile.

Each grave had a number assigned to it, and when a skeleton was found therein this number was written on the skull and on all the more important bones.

In some cases remains of more than one skeleton were found in a grave, and then identification of the bones into the respective skeletons sometimes became impossible.

Through the generosity of Mr. A. B. Pearson-Gee, the skeletons were carefully

26.4.98

packed and brought to England. On their arrival they were taken to University College, where the various investigations have been carried out.

A series of measurements have been made on the skulls by Mr. HERBERT THOMPSON, and some of the results have already been published by Professor PETRIE* and by Professor KARL PEARSON.†

In the autumn of 1895 the skeletons were most kindly placed at my disposal by Professor PETRIE, and I desire to heartily express to him my gratitude for the use of the bones. I also wish, in this place, to very warmly acknowledge my indebtedness to Professor W. F. R. WELDON for many valuable suggestions and for encouragement in this laborious undertaking, also to Professor PEARSON and to Professor G. D. THANE for kindly criticism and ever-ready help.

The measurements were taken by means of an osteometric board, kindly lent for the occasion by Professor STEWART. This board has two uprights, one is fixed and the other slides over a scale graduated into millimetres.

The bone is held horizontally in position, one end is placed against the fixed upright, and then the sliding upright is brought up against the opposite extremity and the measure is read off from the scale. For certain measurements it was necessary to use two projecting styles fixed to the uprights.

The measurements were recorded to the tenth of a millimetre. A small series of bones were re-measured on an independent occasion, and it was found that the mean difference between the measurements was only 0·37 mm. Such a result as this would be scarcely possible with recent bones, for the mere variation in the humidity of the air would produce a greater difference in the measures.

The observations will be dealt with in three separate sections: (1) the limb bones, (2) the sacrum, (3) the scapula; finally, we shall give a short summary of results and a few general conclusions.

I. THE LIMB-BONES.

We will first describe the various measurements made on the different bones.

1. *The Femur.*

(*a.*) The length AB (see fig. 1 in the Plate), which is the distance between the most prominent point of the head and that of the inner condyle, is called the *maximum length.*

(*b.*) The "length in oblique position" (= BF) was measured by placing the condyles flat against the fixed upright. This gives the effective length with regard to stature; it is the *oblique length.* We may express the relation between these two dimensions by finding the angle ABF, which is equal to $\sec^{-1}\frac{AB}{BF}$. Since the condyles

* 'Naqada and Ballas,' 1895, p. 51.

† 'Phil. Trans.,' A, vol. 187 (1896), p. 279.

are practically horizontal when the knees are close together, this angle will depend to a large extent upon the width of the pelvis, and so will be greater in woman than in man.

(*c.*) *The Angle of the Neck with the Shaft.*—If lines are drawn parallel to the axes of the neck and shaft, they will intersect at a point O (fig. 1). This was done on both the anterior and posterior surfaces of the bone. The central point (C) of the inner surface of the head was readily found, then the length CD was measured. OD and OC were measured on both sides of the bone and the mean was taken. It appeared to me that these dimensions were obtained more accurately by this method than if the anterior surface alone were taken.

OC = *Length of Neck + Head.*—The point O is always close to the tubercle on the trochanteric ridge and often actually on it. Some anatomists measure to the tubercle; and this measurement is very nearly equivalent to OC.

OD = *Length of Shaft.*—The angle DOC, which is the angle of the neck with the shaft, was found by the solution of the triangle DOC. This angle was determined on 140 femora.

(*d.*) *The Angle of Torsion.*—To measure accurately the real angle of torsion seemed to me excessively difficult. The angle I measured was the inclination of the neck to the horizon when the bone is held horizontally, with the condyles placed on a flat surface. This angle is certainly closely proportional to the true torsion angle and is not far removed from it. The following was the method employed. A point C′ (see fig. 2) was found on the head, such that O′C′ was parallel to the axis of the neck; O′C′ was measured. The bone was then placed in the position indicated in fig. 3, and the movable upright was drawn along till the point of the style was seen to be vertically above the point O′. The eye was placed about 2 feet above the bone. The distance between the points of the styles was recorded (= O′C″). Now, the angle $C'O'C'' = \sec^{-1}\frac{O'C'}{O'C''}$, which is equal to the angle which the neck makes with the horizon. The effect of parallax was the chief source of error in this method, but several measurements were always taken and the mean determined.

2. *The Tibia.*

(*a.*) The *maximum length* in the long axis of the bone; thus, both the spine and the malleolus are included = AB (fig. 5).

(*b.*) The length FB″, which is the distance from the centre of the inner condyloid surface to the tip of the malleolus.

(*c.*) The length FB′ measured from centre to centre of articular surfaces.

3. *The Fibula.*

The *maximum length.*

4. *The Humerus.*

(*a.*) The *maximum length* AB (see fig. 4).

(*b.*) The *oblique length* FA; this measure corresponds to the oblique length of the femur.

5. *The Radius.*

(*a.*) The *maximum length* in the long axis of the bone AB (fig. 6).

(*b.*) The distance between the points where the longitudinal axis of the bone cuts the proximal and distal articular surfaces (= FB′). This measure answers to the third on the tibia, and it would appear to give the true functional length of the bones more nearly than the other dimensions.

6. *The Ulna.*

(*a.*) The *maximum length* in the long axis including the styloid process.

(*b.*) The distance between the centre of the distal articular surface and the point where the longitudinal axis cuts the surface of the olecranon.

7. *The Clavicle.*

The *maximum length* when the bone is placed on its ventral edge.

The Determination of Sex.

This has been a matter of very considerable difficulty, and it will be seen from the tables of measurements that no decided opinion could be expressed in the case of a large number of skeletons.

Professor Thane had made a careful sex-determination on the skulls, subsequently he did the same for the hip-bones. Besides this, every bone, when taken from the packing-case and measured, was noted down as "male," "female," or "doubtful." The several bones of the different skeletons were quite indiscriminately mixed, and so each bone was pronounced upon independently. The general form or robustness of the bone, the muscle impressions, &c., were taken into account. On subsequently sorting the measurements into skeletons it was found how far the different determinations agreed. In a considerable number of cases there were no discrepancies, in other cases there was a quite clearly-marked preponderance of either "male" or "female," then the skeleton was assigned to the sex possessing the preponderance. Sometimes the sex remained altogether doubtful.

The sex-determinations having been made in this way from the long-bones, they were compared with those obtained from the skulls and hip-bones.* It was found that they agreed very fairly well with the skull determinations but still better with

* In many cases the fragmentary skeletons having skulls had no long-bones, and *vice versâ*; similarly with the hip-bones.

those from the pelvic-girdle. Consequently, as the hip-bone is the safest guide to sex, a certain degree of reliance may, I think, be placed on the male and female series which was ultimately drawn up.

The sacrum was found to be quite useless in this respect.

The Variation in Length of the Limb-Bones.

In Table I. we have a list of the various measures made on the long-bones. The bones of the right side were selected, except in the case of the ulna, where the left bones happened to form the larger series. The third column gives the arithmetic means of the different dimensions expressed in millimetres.*

The probable errors of the means are given by the formula $0{\cdot}6745 \dfrac{\text{Standard Deviation}}{\sqrt{\text{No. of Observations}}}$ and a rough estimate of their values may be made by mere inspection.

In the following table† I have compared some of the means found for the New Race with the means of the measurements made by Dr. E. Rollet‡ on the French. A certain resemblance is seen to exist between them; the bones which diverge most are the tibia and radius. From this we might be tempted to believe that the stature of the New Race was not far removed from that of the French; but the relation which exists between stature and the length of limb will not be dealt with in the present paper.

Bones of the right side.	French.§				New Race.			
	No.	Mean.	Standard deviation.	Coefficient of variation.	No.	Mean.	Standard deviation.	Coefficient of variation
Femur (maximum), ♂	50	452·28	23·72	5·425	80	459·30	25·19	5·484
" " , ♀	50	415·70	22·55	5·425	113	426·27	20·75	4·867
Tibia (excluding spine), ♂	50	368·06	17·99	4·888	85	379·70	18·77	4·943
" " , ♀	50	334·44	18·63	5·571	115	349·57	17·14	4·903
Humerus (maximum), ♂	50	330·10	15·38	4·659	62	326·18	17·01	5·216
" " , ♀	50	297·66	15·25	5·123	97	298·66	14·95	5·006
Radius (maximum), ♂	50	243·94	11·70	4·796	47	256·97	12·90	5·021
" " , ♀	50	214·86	10 95	5·096	66	233·29	10·69	4·583

* The relative length of the male bone to the female bone is expressed by the "*Sexual Ratio.*" The coefficients of variation are dealt with in a similar manner. I shall here attempt no comparison of the sexual ratios in different races, as this is now being done by Professor Pearson. It may however be noticed that the size-ratio appears to be greater in the radius, ulna, and clavicle than in the other bones.

† I am indebted to Professor Pearson for the French numbers. They were calculated from the measurements made by Dr. Rollet at the Anatomical Laboratory at Lyons.

‡ "De la mensuration des os longs des membres," Lyons, 1889.

§ Two or three left bones are included here.

TABLE I.

Bones of right side.	No.	Mean.	Standard deviation.	Coefficient of variation.	Pairs. No.	Pairs. Right. Mean.	Pairs. Right. Standard deviation.	Pairs. Right. Coefficient of variation.	Pairs. Left. Mean.	Pairs. Left. Standard deviation.	Pairs. Left. Coefficient of variation.
Femur (maximum length), ♂	80	459·300	25·190	5·484							
„ (length in oblique position), ♂	80	455·950	24·928	5·467	48	453·250	25·148	5·548	454·500	24·550	5·401
„ (maximum length), ♀	113	426·270	20·748	4·867							
„ (length in oblique position), ♀	113	422·146	20·825	4·933	66	421·409	19·449	4·615	422·864	20·608	4·873
Sexual ratio, $\frac{♂}{♀}$, femur (oblique)	..	*1·080*	..	*1·108*							
Tibia (maximum length), ♂	85	389·347	19·615	5·038							
„ (excluding spine), ♂	85	379·700	18·769	4·943							
„ (length from centre to centre of articular surfaces), ♂	85	365·170	17·898	4·901	57	365·815	18·348	5·016	366·553	19·102	5·211
„ (maximum), ♀	115	358·256	17·658	4·929							
„ (excluding spine), ♀	115	349·569	17·138	4·903							
„ (from centre to centre), ♀	115	335·691	17·043	5·077	100	336·620	16·295	4·841	337·640	16·322	4·834
Sexual ratio, $\frac{♂}{♀}$, tibia (centre to centre)	..	*1·088*	..	*0·965*							
Fibula (maximum length), ♂	23	373·674	..	..	9	371·988	..	..	373·333	..	..
„ (maximum), ♀	42	347·786	21·770	6·259	15	347·240	..	..	347·633	..	..
Sexual ratio, $\frac{♂}{♀}$	..	*1·074*		..							
Humerus (maximum), ♂	62	326·177	17·014	5·216							
„ (length in oblique position) ♂	62	321·984	16·501	5·125	33	318·227	14·685	4·615	314·682	14·640	4·652
„ (maximum), ♀	97	298·655	14·952	5·006							
„ (oblique), ♀	97	295·974	14·768	4·990	52	294·885	14·215	4·821	288·846	14·245	4·932
Sexual ratio, $\frac{♂}{♀}$, humerus (oblique)	..	*1·088*	..	*1·027*							

TABLE I. (continued).

Bones of right side.	No.	Mean.	Standard deviation.	Coefficient of variation.	Pairs. No.	Pairs. Right. Mean.	Pairs. Right. Standard deviation.	Pairs. Right. Coefficient of variation.	Pairs. Left. Mean.	Pairs. Left. Standard deviation.	Pairs. Left. Coefficient of variation.
Radius (maximum), ♂	47	256·968	12·901	5·021							
„ (centre to centre), ♂	47	243·351	12·618	5·185	21	245·785	11·957	4·865	243·738	11·135	4·568
„ (maximum), ♀	66	233·288	10·690	4·583							
„ (centre to centre), ♀	66	221·166	10·653	4·817	27	219·907	9·673	4·398	216·833	9·933	4·581
Sexual ratio, $\frac{♂}{♀}$, radius (centre to centre)	..	*1·100*	..	*1·076*							
Left ulna (maximum), ♂	41	276·451	15·442	5·586							
„ (excluding styloid), ♂	41	270·573	15·056	5·564	21	277·243	..	..	275·286	..	..
„ (maximum), ♀	66	250·500	13·869	5·537							
„ (excluding styloid), ♀	66	245·712	14·396	5·859	28	247·611	..	..	245·261	..	..
Sexual ratio, $\frac{♂}{♀}$, ulna (2nd measure)	..	*1·101*	..	*0·950*							
Clavicle (maximum), ♂	34	151·853	10·621	6·995	9	152·266	..	..	153·900	..	..
„ „ ♀	55	136·854	9·208	6·728	17	135·918	..	..	137·323	..	..
Sexual ratio, $\frac{♂}{♀}$	..	*1·110*	..	*1·040*							
Mean of sexual ratios	..	*1·092*	..	*1·028*							

In the 4th column the constant known as the "Error of Mean Square" (AIRY), or the "Standard Deviation" (PEARSON), is given. This is expressed in millimetres, and was always determined from the second "moment-coefficient" of the trapezia-system and not from the loaded ordinates. It is an absolute measure of dispersion about the mean. A relative measure is $\frac{\text{Standard Deviation}}{\text{Mean}}$,* this is called the "coefficient of variation," and has recently been introduced by Professor PEARSON. These relative measures of variability are given in the 5th column of the table.

The probable error of a standard deviation (σ) is given by an approximate formula $0{\cdot}6745 \frac{\sigma}{\sqrt{2n}}$, and of a coefficient of variation (v) by $0{\cdot}6745 \frac{v}{\sqrt{2n}}$, where $n =$ the number of observations. A general idea of the values of the probable errors may be obtained by inspection, as in the case of the means.

We can now see that the absolute measure of variation, as given by the standard deviation, is always greater in the longer bones than in the shorter, and in the male than in the female. There is no obvious reason why this should be the case; although, for instance, the tibia is a somewhat shorter bone than the femur, yet the absolute variation in magnitude is not necessarily smaller in the former than in the latter. Similarly, although the mean length of the bones of the female is shorter than that of the male, it does not follow that the standard deviation should be less. And does a percentage measure always express the variability of an organ as it affects an individual organism? Take, for example, the two femora of a man, if one is a quarter of an inch longer than the other, the percentage variation does not concern him, it is the absolute variation of a quarter of an inch that is of importance. It thus appears that a ratio-measure of variation does not always express the variability of a dimension as it affects the individual.

With this reservation we will examine the 4th and 5th columns of the table.

It will be seen that the *absolute variation* of the bones diminishes as we pass from the femur to the clavicle, that is as the dimension becomes smaller. Or, in other words, the absolute variation is roughly proportional to the absolute length. Also it can be observed that the female is considerably less variable than the male.

The *ratio-measure* of variation, on the other hand, indicates that the femur, tibia, humerus, and radius are all about equally variable, while the tibia, ulna, and clavicle appear to exhibit little, if any difference in this respect between the sexes.

These results would seem to show that the variability of the two sexes, relative to each other, is far from constant in different races. In the comparative table given above, we see that in the French the female is more variable than the male in the tibia, humerus, and radius, while in the New Race there is a distinct reverse tendency.

The present results would appear to confirm Professor PEARSON'S generalisation

* This ratio is more conveniently expressed as a percentage.

that "the more primitive and savage a race the less will be the variation of both sexes, and the greater will be the approach to equality of variation between the sexes."*

It will now be best to deal with each bone separately.

The Femur.

In the very great majority of the femora the linea aspera was strongly marked, indicating great use of the muscles of the posterior part of the thigh. Frequently also the gluteal ridge was very prominent and rugged. The form of femur known as "femur à pilastre" occurred with considerable frequency. Here the linea aspera projects as a strong ridge or column. Two fairly distinct types were noticed: in the one (*F.l.* 235 in Plate) a cross section through the middle of the shaft would roughly resemble an isosceles triangle with the two sides slightly concave and the base convex; in the other, which is the commoner form (*F.r.* 175), the upper part of the triangle would appear to be replaced by a rectangle and the base would be somewhat more convex. In the latter type the flat top to the rectangular prism is much roughened, while in the former this is replaced by a moderately smooth edge.

It is much to be hoped that on some future occasion the transverse and antero-posterior diameters may be measured on all the femora, and then an accurate determination of this character could be made. At present it is only possible to state that the male series exhibited this form of femur more frequently than the female. As many as 8 per cent. of the male femora, but only 3 per cent. of the female possessed a strongly-marked column, while in 13 per cent. of the men and in 7 per cent. of the women this character was exhibited in a less pronounced form. To give some idea of these groups I measured five femora, and the "*pilastric indices*"† were 128, 124, 123 belonging to the first group, and 119 and 117 to the second group. The diameters were taken at the middle of the shaft.

Sir William Turner, in describing the bones collected by the *Challenger* Expedition, remarked that some of the femora, especially those from New Zealand, exhibited an antero-posterior compression at the upper end of the shaft. This condition has been termed "platymery" by M. Manouvrier, and he has instituted a *platyemric index*, which resembles the pilastric index, only that the diameters are taken at the sub-trochanteric section instead of at the middle of the shaft.

I have found that this platymeric condition was conspicuously exhibited in the few femora which had a very low pilastric index, while on the other hand the femora which possessed high pilastric indices seldom showed a trace of flattening at the

* "The Chance of Death and other Studies in Evolution," vol. 1, p. 303. This volume is about to be published.

† Pilastric index $= \dfrac{\text{Antero-posterior diameter}}{\text{Transverse diameter}} \times 100.$

upper end of the bone. This observation confirms MANOUVRIER's statement that pilastric femora seldom exhibit platymery to any marked degree. Dr. HEPBURN* has recently determined the platymeric and pilastric indices on the femora of a considerable number of races, and his results agree in the main with this view, namely, that femora with high pilastric indices exhibit, as a rule, but little platymery,† while those with low pilastric indices are frequently platymeric to a greater or less degree.

In a few of the femora the antero-posterior diameter at the middle of the shaft was considerably less than the transverse, and so the index was below 100. The indices in two cases were: pilastric index, 89·8; platymeric index, 62·6 (see Plate *F.r.* 7)‡; and 96·3 and 76·4 respectively.

The Length-measurements of the Femur.

Table II. records the measurements made on the right femur in the oblique position. In the first and second divisions, headed male and female respectively, the measurements are absolute and are expressed in millimetres. In the third division the sexes are mixed, but the length of the femur is given in terms of the length of the tibia (measurement "*b*" where spine is excluded). When only one tibia was found in the skeleton it was taken as the standard, whether it was a right or left bone; if both tibiæ were present, the mean of the two was taken.

At the bottom of the table are given the various constants to the curves, which were calculated by the method of moments introduced by Professor PEARSON.§ All these constants are expressed in terms of the units which are to be found at the tops of the 1st, 4th and 7th columns respectively.

$$\text{The centroid} = \text{position of arithmetic mean.}$$
$$\mu_2 = \text{the second "moment coefficient."}$$
$$= \frac{\text{the 2nd moment about the centroid}}{\text{No. of observations}}.$$
$$\sigma = \sqrt{\mu_2} = \text{Standard Deviation (Pearson).}$$
$$= \text{Error of Mean Square (Airy).}$$
$$\mu_3 = \text{the third "moment coefficient."}$$
$$\mu_4 = \text{the fourth "moment coefficient."}$$
$$\beta_1 = \mu_3^2/\mu_2^3, \text{ and } \beta_2 = \mu_4/\mu_2^2.$$

The critical function $= 2\beta_2 - 3\beta_1 - 6$. When this expression is positive the theoretical curve has an unlimited range, but when negative the range is limited.

* 'Journal of Anatomy,' vol. 31, 1896.

† The Maoris would seem to form an exception.

‡ In this femur there was a third trochanter; its position is indicated in the diagram by the sign (*) placed against the protuberance at the lower corner.

§ 'Phil. Trans.,' A, vol. 186, 1895, pp. 343–414.

TABLE II.

R. femur in oblique position.						R. femur expressed in thousandths of tibia (malleolus included).		
Male series.			Female series.			Sexes mixed.		
Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 0·008 of tibia length.	Thousandths of tibia length.	Frequency.
1	405–410	1	1	376–381	2	1	1142–1149	1
2	411–416	3	2	382–387	3	2	1150–1157	6
3	417–422	1	3	388–393	5	3	1158–1165	6
4	423–428	5	4	394–399	7	4	1166–1173	10
5	429–434	7	5	400–405	10	5	1174–1181	15
6	435–440	7	6	406–411	12	6	1182–1189	21
7	441–446	7	7	412–417	8	7	1190–1197	19
8	447–452	4	8	418–423	8	8	1198–1205	17
9	453–458	11	9	424–429	12	9	1206–1213	13
10	459–464	8	10	430–435	16	10	1214–1221	23
11	465–470	4	11	436–441	11	11	1222–1229	16
12	471–476	7	12	442–447	8	12	1230–1237	12
13	477–482	2	13	448–453	5	13	1238–1245	10
14	483–488	5	14	454–459	2	14	1246–1253	7
15	489–494	3	15	460–465	2	15	1254–1261	1
16	495–500	3	16	466–471	1	16	1262–1269	3
17	501–506	0	17	472–477	0	17	1270–1277	1
18	507–512	0	18	478–483	1	18	1278–1285	1
19	513–518	0				19	1286–1293	0
20	519–524	1				20	1294–1301	1
21	525–530	0						
22	531–536	1						
No. of observations .		80	No. of observations .		113	No. of observations .		183
Centroid = 9·0750. $\mu_2 = 17·2610$. $\sigma = 4·1546$. $\mu_3 = 35·0033$. $\mu_4 = 965·6331$. $\beta_1 = 0·2382$. $\beta_2 = 3·2400$. Critical function = − 0·235.			Centroid = 8·2743. $\mu_2 = 12·0471$. $\sigma = 3·4709$. $\mu_3 = 2·7945$. $\mu_4 = 379·0705$. $\beta_1 = 0·0045$. $\beta_2 = 2·6119$. Critical function = − 0·790.			Centroid = 8·4918. $\mu_2 = 12·6133$. $\sigma = 3·5515$. $\mu_3 = 13·6154$. $\mu_4 = 452·8204$. $\beta_1 = 0·0924$. $\beta_2 = 2·8462$. Critical function = − 0·585.		

On account of the comparative fewness of observations the values of the constants coming after σ must be regarded as only very roughly giving some kind of approximation to true values. Still, it may be observed, that in the case of the femur all three critical functions are negative, and it will be found with the other bones that a negative value occurs more frequently than a positive one. From this it would seem that the curves resulting from the measurements of bones belong to that skew type which has a strictly limited range. How far such a theoretical range has any practical significance remains to be demonstrated, but it would require a much larger series than we have here before the theory could be satisfactorily applied to the length of bones. The range, given by the 113 female femora, has, however, been calculated; it is equal to 25·28 units, while the observed range is 18 units.

In the accompanying diagram, the frequency polygons are drawn. They all exhibit a marked double-humped character.* The number of observations is too small for us to feel any certainty as to the meaning of this. Perhaps it is a mere accident, or it may indicate that we have here two races, or a slight admixture of the sexes. If we compare these polygons with those given by the tibiæ, we shall see that the latter exhibit the double peak less strongly than do the former, while in the case of the humerus and of the radius, this character seems to have nearly disappeared. This favours the view that the double peak is merely accidental. It must be observed, however, that in two closely allied races, the femora might differ in length more perceptibly than the other bones, and so such a comparison is scarcely conclusive as to the homogeneous nature of the material. It may be remarked here, that most of the curves exhibit a distinct tailing off on the positive side of the centroid, the slope of the curve being steeper on the negative side. We have above seen that the polygons show a marked tendency to conform to skew curves of limited range, and we may conclude that this range is greater on the positive than on the negative side of the mean, or, in other words, that there is greater abnormality among long than among short bones.

On referring to Table I., it will be seen that the word "pairs" is placed at the head of the right half division. By a "pair" we mean the right and left bones of the same skeleton. In 47 pairs of male femora, the mean of the right bones was 1·11 millims. lower than the mean of the left, and in 66 female femora it was 1·55 millims. lower. The relation which was observed between the two sides is shown in the following scheme :—

Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. bones.†	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Per-centage.	No. of pairs with the R. bones greater than the L.	Per-centage.	Average pre-ponderance of R. over L.	No. of pairs with the L. bones greater than the R.	Per-centage.	Average pre-ponderance of L. over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Femur .	♂	47‡	−1·11	10	21·3	17§	36·2	2·52	28§	59·6	3·40
(Oblique)	♀	66	−1·55	12	18·1	18	27·3	2·74	46	69·7	3·30

* The ratio-curve, we should expect, would give some signs of its compound nature, for the femur, in proportion to the tibia, is slightly shorter in man than in woman, as we shall see later on.

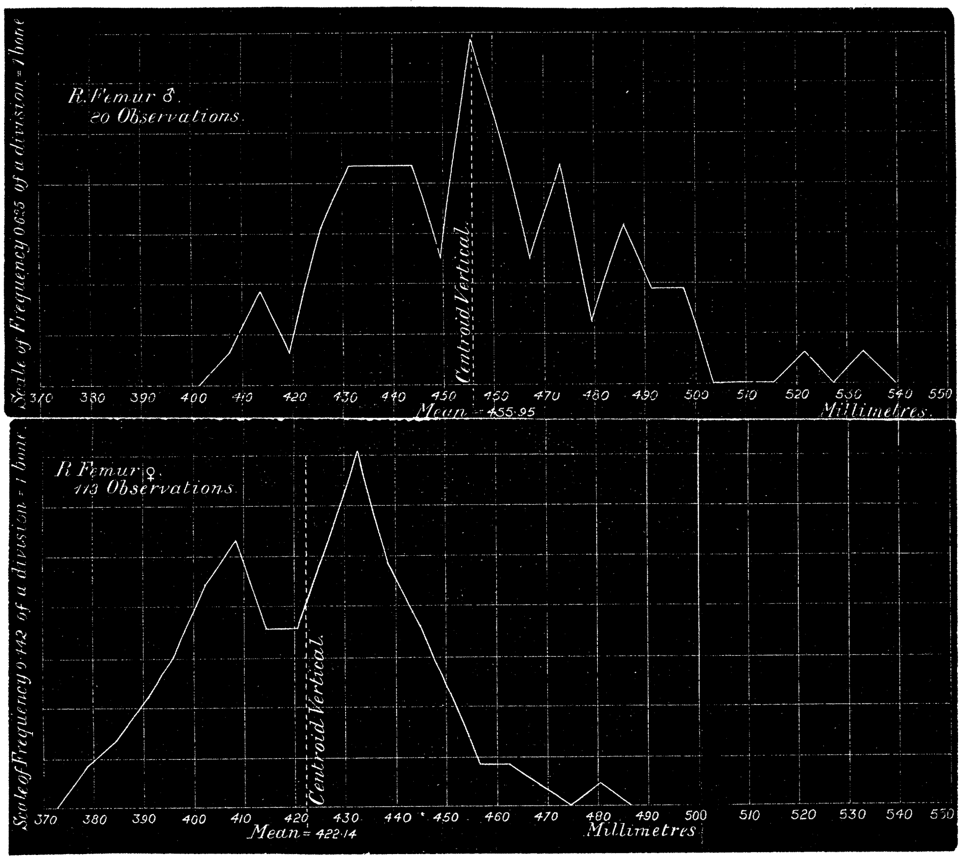
† These means were found by direct addition and division, and not from the centroid of the polygon in which the measurements were grouped. With such a few observations, a slight difference would be expected to occur.

‡ I have omitted a doubtful pair here, No. 874. It was included in Table I.

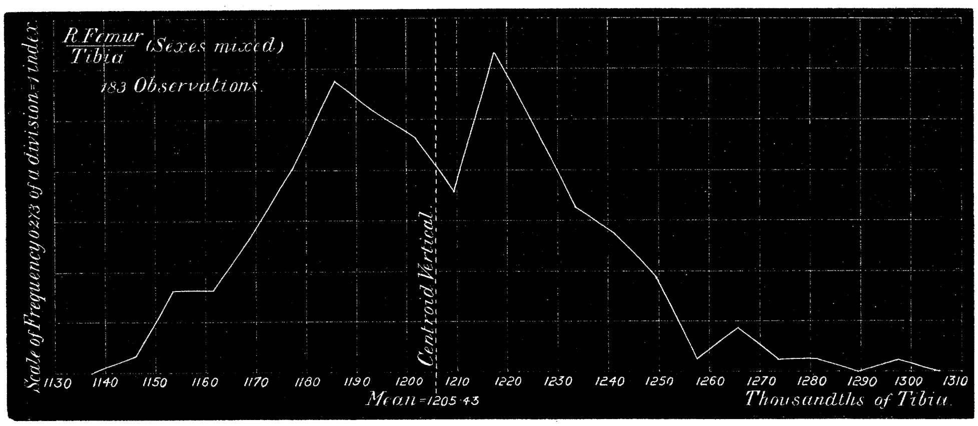
§ These numbers were obtained by using all the bones, whether they differed from one another by less than 1 millim. or not.

These results are similar to those obtained by Dr. J. G. GARSON,* who some years ago investigated the subject of "side" on a series of 70 femora and tibiæ belonging to different races and to both sexes. Out of his 70 pairs of femora, the right and

Diagram I.



The above curves are reduced to the same area by adjusting the vertical scale.



left bones differed from one another by less than 1 millim. in 9 cases (12·8 per cent.), while in 20 cases (28·6 per cent.) the right was greater than the left, and in 41 cases

* 'Journal of Anatomy,' vol. 13, 1879.

(58·5 per cent.) the left was greater than the right. It was also noticed, that when the right bone was greater than the left, the difference between them (average preponderance = 2·9 millims.) was as a rule somewhat less than when the left was greater than the right (average preponderance = 3·8 millims.). A similar tendency can be seen in the present results.

An examination of the above table would appear to show that the difference between the means of the two sides was rather greater in woman than in man, and from this we should anticipate that there would be fewer cases in which the left bone was shorter than the right, and such we find actually occurs.

The standard deviations and the coefficients of variation appear to indicate no constant difference between the variability of the bones of the right and left side.

The Length of the "Neck + Head" of the Femur.

This dimension was measured from the point O (see Plate 22, fig. 1) to the point where the axis of the neck intersects the surface of the head. The latter point was always situated a short distance above the fossa for the interarticular ligament.

The measurements were expressed in terms of the maximum length of the femur (AB), and also in terms of the length of the shaft (OD). The results are given in Table III. The constants thus found show that the length of the neck + head in proportion to the length of the femur is greater in the male than in the female; also, according to both absolute and ratio-measures of variability, man would appear to be more variable than woman in this respect.

To ascertain the relationship between this length and the effective length of the femur (oblique length), a correlation was instituted between the two dimensions. Table IV. gives the means and variation constants of the pair of dimensions for each sex. The "r" to the right of the table is the "coefficient of correlation." This fraction expresses the relationship between the parts such that

If X = the average deviation of neck + head associated with a known mean deviation of a group of femora;
A = this known mean deviation of the femora;
Q_N = an absolute measure of the variability of neck + head;
Q_F = the similar measure of variation of the femur;

then

$$\frac{X/Q_N}{A/Q_F} = r. \quad \text{Therefore } X = (rQ_N/Q_F)\,A.$$

rQ_N/Q_F is called the "Coefficient of Regression."

These coefficients of correlation (otherwise known as GALTON'S Functions) were determined by means of the formula used by Professor PEARSON,*

* 'Phil. Trans.,' A, vol. 187, 1896, pp. 253-318.

$$r = \frac{\Sigma \text{ deviation of A from its mean} \times \text{deviation of B from its mean}}{n\sigma_A\sigma_B},$$

where n = number of observations, and $\sigma_A\sigma_B$ are the standard deviations of the dimensions A and B respectively.

The probable errors of the coefficients were calculated from the formula,

$$0.6745 \frac{1 - r^2}{\sqrt{r(1 + r^2)}}.$$

TABLE III.

$\dfrac{\text{Neck + head of femur}}{\text{Maximum length of femur}}$.

Male series.			Female series.		
Unit = 0·004 of the length of the femur.	Thousandths of femur.	Frequency.	Unit = 0·004 of the length of the femur.	Thousandths of femur.	Frequency.
1	135–138	1	1	129–132	1
2	139–142	0	2	133–136	0
3	143–146	3	3	137–140	2
4	147–150	4	4	141–144	2
5	151–154	3	5	145–148	12
6	155–158	10	6	149–152	17
7	159–162	11	7	153–156	25
8	163–166	6	8	157–160	12
9	167–170	4	9	161–164	11
10	171–174	1	10	165–168	4
11	175–178	2	11	169–172	0
			12	173–176	1
No. of individuals . .		45	No. of individuals . .		87
Mean . . . . = 158·6333 Standard deviation . . = 8·4894 Coefficient of variation . = 5·352			Mean . . . . = 154·0402 Standard deviation . . = 7·1932 Coefficient of variation . = 4·670		

$\dfrac{\text{Neck + head of femur}}{\text{Length of shaft}}$.

Male series.			Female series.		
Mean.	σ.	ν.	Mean.	σ.	ν.
183·855	10·585	5·757	179·029	9·023	5·043

TABLE IV.

Correlation between neck + head of femur and the oblique length of femur.											
Sex.	No. of individuals.	Dimension.	Mean.	σ.	ν.	Dimension.	Mean.	σ.	ν.	r.	Probable error of r.
♂	43	Neck + head	71·604	4·940	6·899	Femur	448·395	18·952	4·227	0·6939	0·0438
♀	61	Neck + head	65·131	4·503	6·914	Femur	420·049	19·637	4·675	0·6772	0·0387

The coefficients of correlation which have been obtained for the above-mentioned pair of dimensions are fairly high, showing that the length of the neck + head varies simultaneously and more or less proportionally to the variations in the oblique length of the femur.

Other things being equal, an increase in the length of neck + head must necessarily increase the oblique length of the femur, and so from the nature of the case a certain amount of correlation must occur. But since the probable error of this dimension is very small in comparison with that of the whole length of the femur, this incidental correlation cannot be large. It may be stated, then, that most of the correlation which has been detected is due to the relation which exists between the variation in the length of the neck + head and that of the shaft of the femur. What was required to be known in the present case was how the deviations in the length of the neck + head are associated with deviations in the effective length of the femur, and under this aspect of the problem the different causes producing the correlation do not concern us.

Man is perhaps slightly more correlated in this respect than woman, but since the probable errors of the coefficients are so considerable, we can feel no confidence in the difference which is shown.

The Angle of the Neck with the Shaft.

This angle was measured by the method previously described; the results are summed up in the left half of Table V.

The mean angle is 2°·56 higher in the female than in the male; also the constants of variation appear to be greater in the former than in the latter.

Table VI. gives the coefficients of correlation between the angle of neck and the proportional length of head + neck to maximum length of femur. We see that the correlation is negative, indicating that a femur having a proportionally short neck and head will, as a rule, possess a somewhat high angle.

TABLE V.

The angle which the neck of the femur makes with the shaft.						The angle which the neck makes with the horizon when the femur is placed horizontally with its condyles on a flat surface.					
Male series.			Female series.			Male series.			Female series.		
Unit = 2°.	Angle.	Frequency.	Unit = 2°.	Angle.	Frequency.	Unit = 2°.	Angle.	Frequency.	Unit = 2°.	Angle.	Frequency.
1	111°–112°	2	1	98°–99°	1	1	2°–3°	1	1	9°–10°	2
2	113–114	0	. . . .	. . . . . .	. . .	2	4–5	0	2	11–12	1
3	115–116	1	8	112–113	1	3	6–7	1	3	13–14	3
4	117–118	4	9	114–115	0	4	8–9	1	4	15–16	3
5	119–120	2	10	116–117	2	5	10–11	1	5	17–18	6
6	121–122	6	11	118–119	1	6	12–13	2	6	19–20	8
7	123–124	7	12	120–121	6	7	14–15	1	7	21–22	5
8	125–126	7	13	122–123	8	8	16–17	2	8	23–24	3
9	127–128	9	14	124–125	13	9	18–19	2	9	25–26	7
10	129–130	4	15	126–127	21	10	20–21	3	10	27–28	10
11	131–132	2	16	128–129	12	11	22–23	5	11	29–30	7
12	133–134	0	17	130–131	9	12	24–25	3	12	31–32	8
13	135–136	0	18	132–133	4	13	26–27	2	13	33–34	6
14	137–138	0	19	134–135	2	14	28–29	4	14	35–36	4
15	139–140	0	20	136–137	5	15	30–31	2	15	37–38	2
16	141–142	0	21	138–139	1	16	32–33	2	16	39–40	3
17	143–144	1	22	140–141	1	. . . .	. . . . .	. . .	17	41–42	2
			23	142–143	1	19	38–39	1			
No. of observations . .		45	No. of observations . .		88	No. of observations . .		33	No. of observations . .		80
Mean = 124°·255. Standard deviation = 5°·578. Coefficient of variation = 4·469.			Mean = 126°·818. Standard deviation = 6°·077. Coefficient of variation = 4·792.			Mean = 21°·712. Standard deviation = 8°·071. Coefficient of variation = 37·12.			Mean = 26°·100. Standard deviation = 7°·779. Coefficient of variation = 29·80.		

TABLE VI.

Sex.	No.	Dimension.	Dimension.	r.	Probable error of r.
♂	45	Angle of neck	$\frac{\text{Neck + head}}{\text{Femur (maximum)}}$	− 0·345	0·084
♀	88	"	"	− 0·273	0·064

Professor HUMPHRY* has stated that this angle "is smaller in short bones than in long bones," and "in women than in men." My measurements do not seem to confirm this conclusion, and it is not clear how the method of measurement would account for the disagreement. We have previously seen that women possess a short neck + head in proportion to the maximum length of the femur, and we now see that in both sexes such a condition tends to be associated with a high angle. In conformity with this, the mean angle in woman might be expected to be slightly higher than in man, and this is what we find in the present measurements. Dr. JOHANN MIKULICZ† has measured the angle of the neck on 100 femora from the Vienna hospitals. He gives the mean angle as lying between 125° and 126°, but the sexes are mixed. This is practically identical with the mean of Table V. The table which MIKULICZ publishes shows very little correlation between the length of the inferior extremity and the angle of the neck, and in the case of the New Race the correlation is very slight, but apparently positive. With regard to sex differences, nothing that is really satisfactory can be deduced from his measurements. I do not think from the data which are at present available that it can be safely concluded that this angle in Europeans is as a rule smaller in women than in men.

The Angle of Torsion.

The method of measurement has already been described. The true angle of torsion is given by the angle which the axis of the neck makes with the transverse axis of the lower extremity of the bone. The angle which was measured is the angle that the axis of the neck makes with the vertical plane touching the posterior surfaces of the condyles when the bone is held upright. This plane, however, is nearly parallel to the transverse axis.

The measurements are given in the right-hand division of Table V. The mean of the female series is 4°·39 higher than that of the male. MIKULICZ has measured the angle of torsion in 120 European femora; although his method of measurement

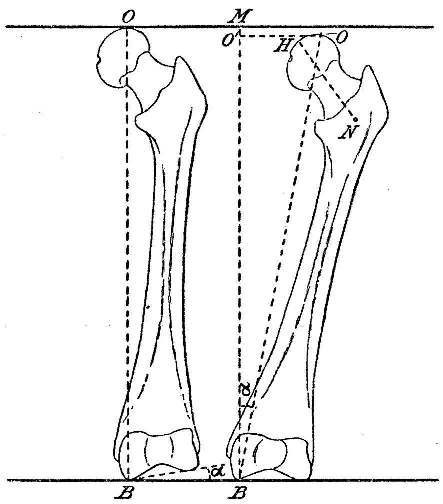
* 'Journal of Anatomy,' vol. 23, 1889.

† 'Archiv für Anatomie,' 1878.

differs from mine, yet our results are comparable. The mean angle of his series is 12°. In 10 cases the angle of MIKULICZ's series was negative, that is, the neck turned posteriorly instead of anteriorly. In my series only one negative angle was found, and that was in a left femur; the measurements I have recorded are those of the right femur. The table which MIKULICZ gives shows a range from $-25°$ to $+37°$ (sexes mixed), while my series ranged in the male from $+2°$ to $+39°$, and in the female from $+9°$ to $+42°$. It will be seen from these figures that the torsion of the femur in Europeans is very considerably less than in the New Race. We may hence conclude that the torsion-angle in the femur differs very widely in different races.

The Relation between the Maximum and Oblique Lengths of the Femur.

The ratio of the maximum length (OB) to the oblique length (O′B) will give the secant to the angle (α) which the condyles make with the horizontal plane when the bone is held vertically in the "maximum position." This angle α is equal to the angle of deflection of the line OB from the vertical when the bone is placed in the "oblique position."



From Table VII. we see that the angle α is 1°·43 larger in the female than in the male. Now, there is apparently no correlation between this angle and the length of the femur (see Table VIII.); consequently it would seem that, other things being equal, the size of the angle depends upon the width of the pelvis. We have previously seen that long femora tend to have a proportionally long neck and head (NH), hence, in tall persons this angle is not necessarily altered, since the shaft of the bone is thrown a little further outwards by the increase in the dimension HN.

From these considerations it appears highly probable that a fairly strong correlation would be found to exist between this angle α and a suitable breadth-measurement of the pelvis, such as the distance between the centres of the acetabula.

The coefficients thus obtained might be of very great service in determining the breadth of the pelvis of prehistoric peoples by means of their femora.

TABLE VII.

The angle which the condyles of R. femur make with the horizontal plane when the bone is held upright in the "maximum position."

Male series.			Female series.		
Unit = 1°.	Degrees.	Frequency.	Unit = 1°.	Degrees.	Frequency.
1	0°	1	1	2°	3
2	1	0	2	3	4
3	2	3	3	4	4
4	3	7	4	5	17
5	4	12	5	6	13
6	5	7	6	7	18
7	6	23	7	8	22
8	7	11	8	9	14
9	8	8	9	10	13
10	9	6	10	11	2
11	10	2	11	12	1
			12	13	1
			13	14	1
No. of individuals . .		80	No. of individuals . .		113
Mean . . . . = 5°·7875			Mean . . . . = 7°·2212		
Standard deviation . . = 2°·0637			Standard deviation . . = 2°·3164		
Coefficient of variation . = 35·658			Coefficient of variation . = 32·078		

TABLE VIII.

Correlation between angle of condyles and maximum length of R. femur.

Sex.	No.	Bone.	Mean.	σ.	Angle.	Mean.	σ.	r.	Probable error of r.
♂	80	Femur	459·3125	25·2365	Angle of condyles	5°·7875	2°·0637	−0·0395	0·0752
♀	113	,,	426·3717	21·0211	,,	7·2212	2·3164	0·0192	0·0634

THE TIBIA.

In Table I. are given the means of the different measurements made on the tibia. With regard to the standard deviations it may be noticed that the maximum length is the most variable dimension in both the male and female, while the distance from centre to centre of articular surfaces would appear to be the least

variable. Reference to the coefficients of variation shows us that the variability is roughly proportional to the length of the dimension; and this is what we found in the case of the different bones, namely, that the longer a bone the greater, as a general rule, is the absolute variation which it exhibits. We now find that the same law holds with respect to different parts of the same bone.

Among the tibiæ some typical examples of the condition known as platycnemia occurred (see Plate 22, *Tr. T.* 40 and *Tr.* 382). It was well marked in 8·5 per cent. of the male series and in 4·6 per cent. of the female, and so, like the pilastric femur, it is less frequent in woman than in man. To give some notion of these groups, I obtained four platycnemic indices;* they were 50, 52·7, 59, 64.

Although it is impossible by mere inspection to give a trustworthy account of this character, yet it may be stated that a platycnemic tibia was frequently associated with a more or less pilastric femur. Thus, in the same skeleton, there seems to be some correlation between the tibia and femur in this respect.

It would be very desirable if the pilastric and platycnemic indices were found for all the couples of these two bones, for then the coefficient of correlation between the two series of indices would accurately measure the relationship which exists between these two conditions in the same skeleton.

Many of the tibiæ, and especially the platycnemic ones, exhibited a very marked curvature of the upper end, such that, when the shaft of the bone was held vertically, the upper part was obviously bent posteriorly.

M. PAUL BROCA originally considered that platycnemia was a sign of degeneration, but he held that the possession of a pilastric femur was a character of superiority. Professor MANOUVRIER† has since pointed out that there are certain differences between the platycnemia in man and that in the anthropoid apes, as exhibited in the gorilla. Platycnemia is due to the antero-posterior expansion of the bone, especially behind the interosseous ridge, and concurrently the posterior surface may disappear. Over the expansion spreads the attachment of the tibialis posticus muscle. In some of the tibiæ of the New Race the surface of attachment of the tibialis anticus was very markedly hollowed out. In the platycnemia of the gorilla both the tibialis posticus and the flexor longus digitorum are inserted on the outer side of the expansion; while in the platycnemia of man the latter muscle comes to be inserted on the inner surface, being pushed round, so to speak, by the great extension of the area of attachment of the tibialis posticus. (See Plate 22, fig. *T. r.*, *T.* 40.)

A careful examination of the tibiæ of the New Race confirmed this view, and the connection between the antero-posterior extension of the tibia and that of the femur in the same skeleton would seem to demonstrate that both characters are due to

* Platycnemic index $= \dfrac{\text{Trans diameter}}{\text{Antero-posterior diameter}} \times 100$ measured at the level of the nutritive foramen.

† 'Mém. de la Soc. d'Anthropologie de Paris,' vol. 3, 1888.

similar causes, and that the platycnemia, as ordinarily exhibited in man, is not a reversion to a simian character, for the pilastric femur is essentially human.

Here, then, we appear to have a character which is produced by the direct action of use, and probably any hardy race of hunters would exhibit the flattening to a greater or less degree. A tibia assumes its platycnemic form only after puberty, and it would be exceedingly interesting to know whether this character, which seems to be purely "acquired," could be inherited.

Some years ago, Mr. ARTHUR THOMSON* drew attention to the fact that in many savage races a facet could be found upon the anterior margin of the articular surface of the tibia with the astragalus. He also noticed that, in the tibiæ exhibiting these facets, the external condyloid surface was frequently flattened, or even convex. These characters he attributed to a frequently-assumed squatting posture. In the majority of the tibiæ of the New Race this facet could be detected, also, in the same bones the outer condyloid surfaces were often convex, instead of being slightly concave. We may hence conclude that "squatting" was the habitual custom of the New Race.

As it has been above remarked, many of the tibiæ exhibited a strong backward curvature of the upper extremity. Professor MANOUVRIER has pointed out that such a curvature would serve to increase the resistance to an anterior sliding of the condyles of the femur in flexion of the leg. MANOUVRIER is inclined to attribute this curvature to the same causes as those producing platycnemia, and my observations are in accordance with his view, in that the platycnemic tibiæ were generally greatly bent. I could trace no connection between this bending and the presence of facets or of the convexity of the outer condyloid surface, for sometimes there was a strong curvature, but no facets could be distinguished, while on the other hand, nearly straight tibiæ often exhibited both facets and convexity of the surface.

The Length-Measurements of the Tibia.

The measurements which were made on the right tibiæ are recorded in Table IX. In the division to the right the sexes are mixed, but the measurements are expressed in terms of the maximum length of the femur.

The frequency polygons are shown in Diagram II. Considering the fewness of observations they are fairly regular.

The dispersion about the mean is clearly asymmetrical, and consequently nothing but some form of skew curve would fit our frequency curve. The critical function of the curve obtained from the absolute measures is negative in both sexes, and so a limited range is indicated In the case of the 115 female tibiæ, the theoretical range is 26·78 units, while the observed range is 15 units.

* 'Journal of Anatomy,' vol. 23, 1889.

TABLE IX.

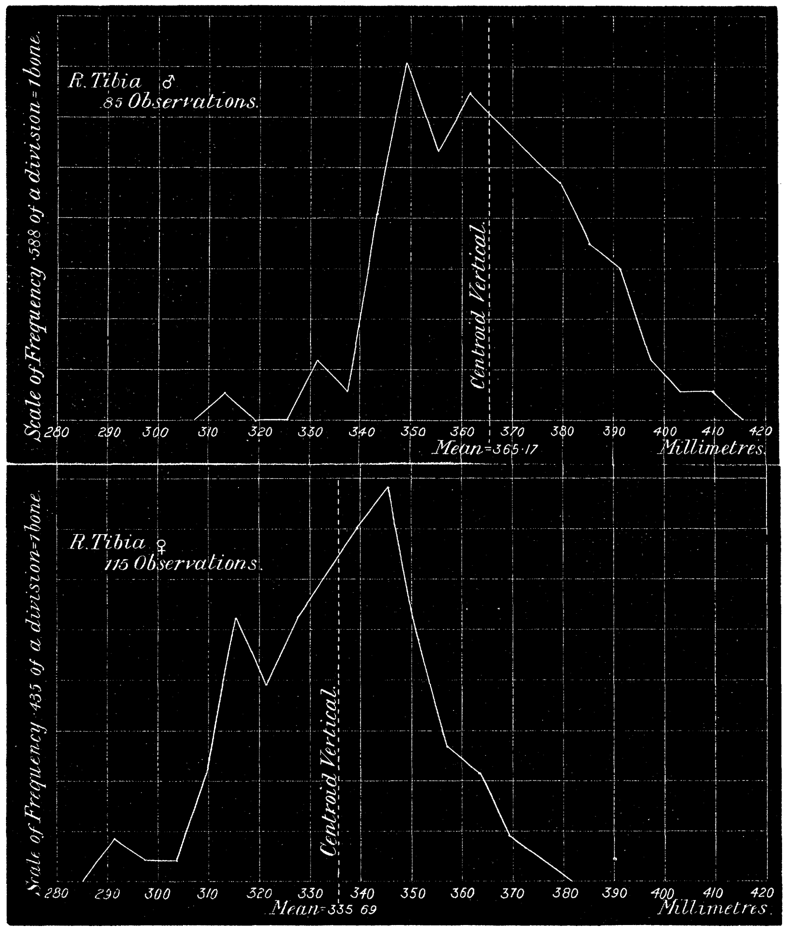
R. tibia measured from centre to centre of articular surfaces.						R. tibia expressed in thousandths of femur (maximum length).		
Male series.			Female series.			Sexes mixed.		
Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 0·0066 of the length of femur.	Thousandths of femur.	Frequency.
1	311–316	1	1	289–294	2	1	725·1–731·6	1
2	317–322	0	2	295–300	1	2	731·7–738·2	2
3	323–328	0	3	301–306	1	3	738·3–744·8	2
4	329–334	2	4	307–312	5	4	744·9–751·4	1
5	335–340	1	5	313–318	12	5	751·5–758·0	1
6	341–346	7	6	319–324	9	6	758·1–764·6	9
7	347–352	12	7	325–330	12	7	764·7–771·2	11
8	353–358	9	8	331–336	14	8	771·3–777·8	20
9	359–364	11	9	337–342	16	9	777·9–784·4	21
10	365–370	10	10	343–348	18	10	784·5–791·0	29
11	371–376	9	11	349–354	11	11	791·1–797·6	22
12	377–382	8	12	355–360	6	12	797·7–804·2	20
13	383–388	6	13	361–366	5	13	804·3–810·8	20
14	389–394	5	14	367–372	2	14	810·9–817·4	11
15	395–400	2	15	373–378	1	15	817·5–824·0	8
16	401–406	1				16	824·1–830·6	5
17	407–412	1				17	830·7–837·2	2
						18	837·3–843·8	1
						19	843·9–850·4	1
						20	850·5–857·0	1
No. of observations .		85	No. of observations .		115	No. of observations .		188
Centroid = 9·6118. μ_2 = 8·8983. σ = 2·9830. μ_3 = 1·0871. μ_4 = 232·5320. β_1 = 0·0017. β_2 = 2·9368. Critical function = −0·141.			Centroid = 8·3652. μ_2 = 8·0681. σ = 2·8404. μ_3 = − 4·4798. μ_4 = 181·9103. β_1 = 0·0382. β_2 = 2·794. Critical function = − 0·525.			Centroid = 10·5160. μ_2 = 9·9696. σ = 3·1574. μ_3 = 1·4866. μ_4 = 352·1503. β_1 = 0·0223. β_2 = 3·5430. Critical function = 1·019.		

The following observations have been made on the relative lengths of the right and left tibiæ of the same skeleton. In the male "pairs" the mean of the right bones was 0·77 millim. lower than the mean of the left, and in the female series it was 1·05 millim. lower :—

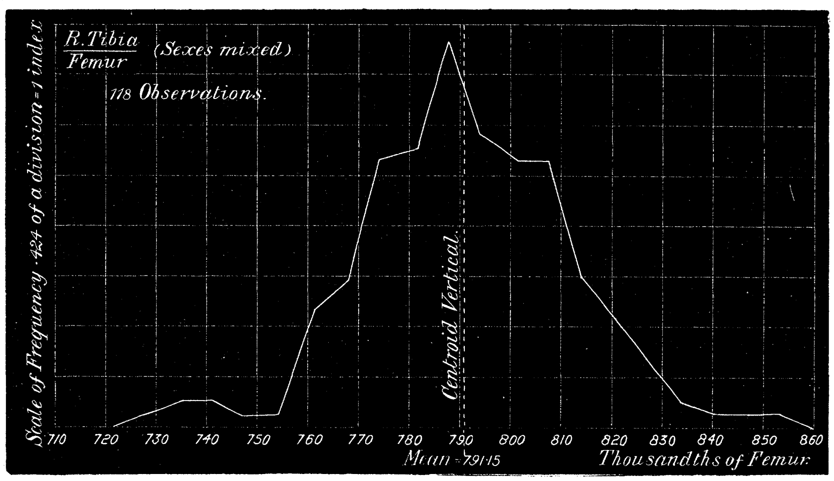
Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. bones.*	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Per-centage.	No. of pairs with the R. bones greater than the L.	Per-centage.	Average pre-ponderance of R. over L.	No. of pairs with the L. bones greater than the R.	Per-centage.	Average pre-ponderance of L. over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Tibia (centre to centre)	♂	57	−0·77	13	22·8	20	35·1	2·41	35	61·4	2·64
	♀	100	−1·05	25	25	35	35	1·52	62	62	2·56

* See the notes which are referred to in the similar table of the femur.

Diagram II.



The above curves are reduced to the same area by adjusting the vertical scale.



Here, as in the case of the femur when the right bone was longer than the left, the difference tends to be somewhat less than when the left was greater than the right. Also the difference between the means of the right and left bones was greater in woman than in man.

We have previously seen that the difference between the means of the right and left femur was — 1·11 millim. in the male and — 1·55 millim. in the female. Hence we find that in the New Race the mean excess of L. femur + L. tibia over R. femur + R. tibia was in the male about 1·88 millim., and in the female about 2·60 millims.

Dr. GARSON stated that in his 70 skeletons the average preponderance of the left limb over the right was 1·5 millim. Also, from certain measurements given by Sir WILLIAM TURNER, it would seem probable that considerable differences exist among races as regards the mean length of the bones on the two sides of the body.

THE FIBULA.

The maximum length of the bone was taken. Among the fibulæ 3 per cent. were excessively flattened or channelled out laterally by deep longitudinal grooves, and 11·3 per cent. exhibited this character to a somewhat less degree. As we should have expected, the flattening of the fibula was related to the platycnemia of the tibia, so that a platycnemic tibia was frequently associated with a more or less channelled fibula.

Like the tibia, the left fibula is longer than the right.

THE HUMERUS.

Both the maximum and the oblique lengths were measured on this bone. The means of the measurements are given in Table I.

Perforation of the septum between the coronoid and olecranon fossæ occurred with remarkable frequency. In some cases the septum had obviously been broken, occasionally it was not easy to be sure whether the perforation was real or had been accidentally produced. Whenever any doubt existed on this head the humerus was excluded from the following statistics :—

Sex.	No. of humeri of right side.	No. which were perforated.	Percentage.	No. of humeri of left side.	No. which were perforated.	Percentage.	Out of 126 pairs.		
							No. of pairs with both right and left bones perforated.	No. of pairs with R. bone perforated only.	No. of pairs with L. bone perforated only.
			per cent.			per cent.			
♂	80	17	21·2	82	28	34·1	..	..	..
♀	109	50	45·9	125	71	56·8	..	..	..
Sexes mixed	232	84	36·2	280	134	47·8	44 (=34·9°/₀)	8 (=6·3°/₀)	25 (=19·7°/₀)

An examination of these figures will show that perforation occurs more frequently in the female than in the male, and on the left side than on the right.

From observations on the elbow-joint, it appeared to me that perforation is largely dependent upon the relative sizes of the olecranon and the olecranon fossa. When the parts were of such a size that on extension of the forearm the beak of the great sigmoid cavity came into contact with the septum, then that septum was generally perforated. The greater frequency of perforation in the female may, perhaps, be due to two causes; (1) the humerus is less robust, and, consequently, the septum is thinner and more readily perforated; (2) and possibly the olecranon is relatively somewhat smaller in woman than in man, for a very slight relative decrease in the size of the olecranon would have a great effect in bringing the beak into contact with the septum. I believe that the perforation occurring more frequently on the left side than on the right is due to this latter influence, for the left olecranon is probably somewhat shorter than the right, because the total length of the left ulna is very appreciably shorter, and it would seem feasible to suppose that the length of the olecranon would be proportional to the total length of the bone.

The strong anterior curvature of the proximal end of the ulna would also help to bring the beak of the olecranon against the septum, and this might perhaps partially account for the incurved ulna and perforated humerus occurring together in certain races.*

Dr. PAUL TOPINARD† has given the following statistics :—

	Perforated.
156 humeri from dolmens around Paris of the Polished Stone Period	21·8 per cent.
30 humeri of the Yellow Races of America	36·2 ,,
200 humeri of Parisians of 4th–12th century	5·5 ,,
218 humeri of Parisians of Middle Ages	4·1 ,,

In Negroes perforation occurs in about 21 per cent.‡

On comparing these percentages with those obtained from the New Race we see that the latter are very exceptionally high.

The Length-Measurements of the Humerus.

Some of the results of the different measurements are given in Table X. In the fourth division of the table the sexes are mixed, but the measurements are expressed in thousandths of the tibia. It may be noticed that the humerus in the oblique position seems to be slightly less variable than when the maximum length is taken (see Table I.). The distributions of deviations about the mean are exhibited to the eye in Diagram III.

* How far such an explanation would apply to anthropoid apes I am not prepared to state. In a Chimpanzee skeleton I examined, both humeri were perforated, but the beak of the olecranon appeared quite incapable of touching the septum.

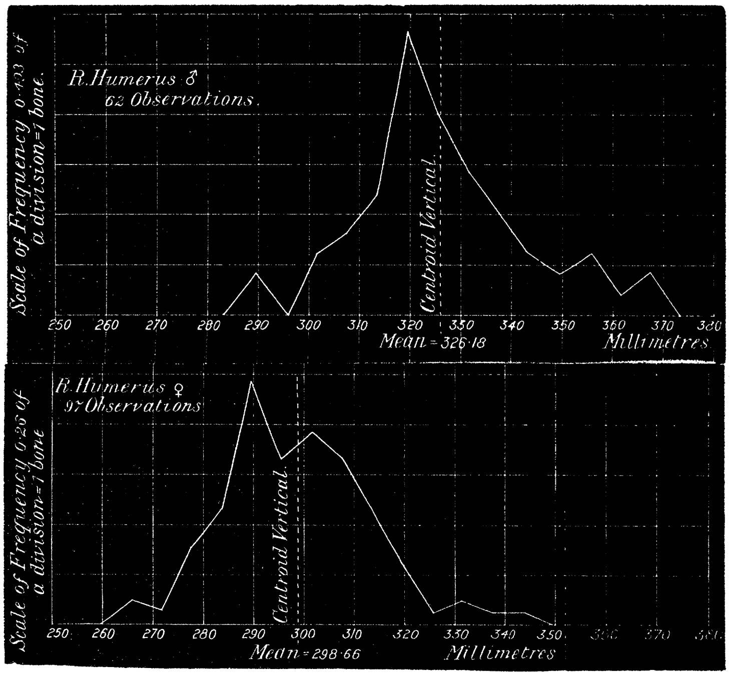
† 'Éléments d'Anthropologie Générale,' Paris, 1885.

‡ See Sir WILLIAM TURNER's Memoir in the '*Challenger* Reports,' vol. 16.

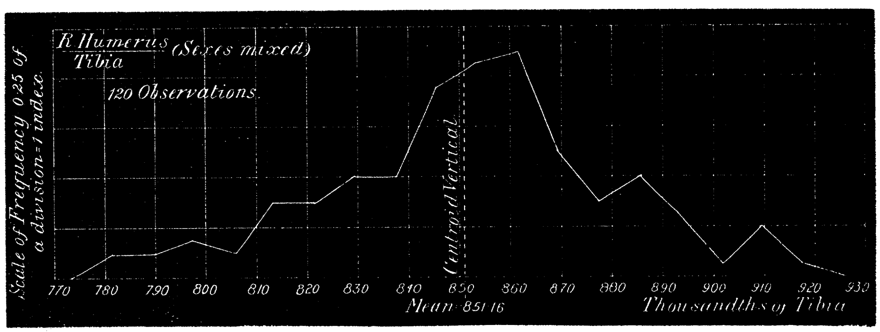
TABLE X.

R. humerus (maximum length).						R. humerus measured in the oblique position.			R. humerus (oblique) expressed in thousandths of tibia (including malleolus).		
Male series.			Female series.			Female series.			Sexes mixed.		
Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 6 millims.	Absolute measures in millims.	Frequency.	Units = 0·008 of tibia length.	Thousandths of tibia.	Frequency.
1	287–292	2	1	263–268	2	1	261–266	2	1	778–785	2
2	293–298	0	2	269–274	1	2	267–272	2	2	786–793	2
3	299–304	3	3	275–280	6	3	273–278	4	3	794–801	3
4	305–310	4	4	281–286	9	4	279–284	12	4	802–809	2
5	311–316	6	5	287–292	19	5	285–290	17	5	810–817	6
6	317–322	14	6	293–298	13	6	291–296	15	6	818–825	6
7	323–328	10	7	299–304	15	7	297–302	16	7	826–833	8
8	329–334	7	8	305–310	13	8	303–308	13	8	834–841	8
9	335–340	5	9	311–316	9	9	309–314	7	9	842–849	15
10	341–346	3	10	317–322	5	10	315–320	4	10	850–857	17
11	347–352	2	11	323–328	1	11	321–326	1	11	858–865	18
12	353–358	3	12	329–334	2	12	327–332	2	12	866–873	10
13	359–364	1	13	335–340	1	13	333–338	1	13	874–881	6
14	365–370	2	14	341–346	1	14	339–344	1	14	882–889	8
									15	890–897	5
									16	898–905	1
									17	906–913	2
									18	914–921	1
No. of observations . .		62	No. of observations . .		97	No. of observations . .		97	No. of observations . .		120
Centroid = 7·1129. $\mu_2 = 8·0410$. $\sigma = 2·8357$. $\mu_3 = 9·2508$. $\mu_4 = 206·5318$. $\beta_1 = 0·1646$. $\beta_2 = 3·1942$. Critical function = − 0·105.			Centroid = 6·5258. $\mu_2 = 6·2098$. $\sigma = 2·4919$. $\mu_3 = 6·0649$. $\mu_4 = 128·6261$. $\beta_1 = 0·1536$. $\beta_2 = 3·3356$. Critical function = 0·210.			Centroid = 6·4124. $\mu_2 = 6·0585$. $\sigma = 2·4614$. $\mu_3 = 6·8472$. $\mu_4 = 131·1392$. $\beta_1 = 0·2108$. $\beta_2 = 3·5728$. Critical function = 0·513.			Centroid = 9·7083. $\mu_2 = 12·0566$. $\sigma = 3·4723$. $\mu_3 = -10·9132$. $\mu_4 = 436·6233$. $\beta_1 = 0·0680$. $\beta_2 = 3·0037$. Critical function = − 0·197.		

Diagram III.



The above curves are reduced to the same area by adjusting the vertical scale.



In the scheme below are given the relations which were observed between the humeri of the right and left sides in "pairs" of bones.

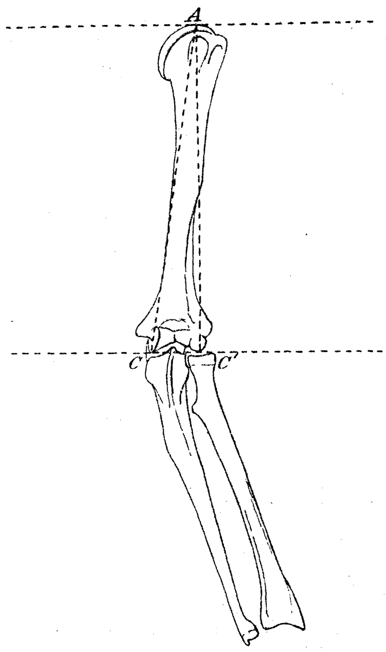
Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. bones.	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Per-centage.	No. of pairs with the R. bones greater than the L.	Per-centage.	Average pre-ponderance of R over L.	No. of pairs with the L. bones greater than the R.	Per-centage.	Average pre-ponderance of L over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Humerus (Oblique)	♂	33	+3·38	4	12·1	27	81·8	4·52	6	18·2	1·75
	♀	52	+5·73	2	3·8	49	94·2	6·15	3	5·8	1·03

Here we notice, as in the femur and tibia, that the difference between the means of the right and left bones was greater in woman than in man.

The bones of the superior extremity were longer on the right side than on the left, while with those of the inferior extremity we have found that the left were longer than the right.

The Relation Between the Maximum and Oblique Lengths of the Humerus.

The oblique length of the humerus is analogous to that of the femur, and the relation between it and the maximum length may be expressed as before by determining the angle which has its secant $= \frac{\text{max. length}}{\text{oblique length}}$. This is the angle which the distal articular surfaces make with the horizontal plane when the bone is held upright in the maximum position, or very nearly equal to the inclination of the axis of the shaft to the vertical when the trochlea and capitellum are placed on a horizontal plane.



The vertical through the most prominent point of head is here made to fall on the capitellum. Frequently it falls outside of this.

The oblique length of the humerus does not represent so closely the effective length of the bone as does the similar measure in the femur, but it would seem to be a better measure of it than the maximum length. This appears to be proved by the following rather remarkable fact. On ascertaining the coefficients of correlation for the lengths of pairs of bones, it was found that all the bones except the radius were more closely correlated with the maximum length of the humerus (AC) than with its oblique length (AC′). The radius, on the other hand, in both sexes, would seem to be slightly more closely correlated with the oblique than with the maximum length.

Let us consider the articulations along CC′. If the inner margin of the trochlea,* C, be supposed to become a little more prominent, then the oblique length will be shorter. Other things being equal, the humerus will be thrown further outwards and the capitellum C′ will approach the head of the radius, which bone will consequently have to be somewhat shorter if there is to be free play for the supination of the hand.

In Table XI. are recorded the angles which were found for the male and female series. The mean of the male series is nearly a degree higher than that of the female, and considering the probable error of the mean, the difference would appear to indicate that this angle is slightly larger in man than in woman.

* The degree of prominence of the inner edge of the trochlea is apparently much more variable than that of the globular capitellum.

TABLE XI.

R. Humerus. The angle which the distal articular surfaces make with horizontal plane when the bone is held upright in the maximum position.

Male series.			Female series.		
Unit = 1°.	Degrees.	Frequency.	Unit = 1°.	Degrees.	Frequency.
1	2°	2	1	− 2°	1
2	3	2	2	− 1	0
3	4	4	3	0	4
4	5	5	4	1	0
5	6	8	5	2	1
6	7	8	6	3	2
7	8	4	7	4	7
8	9	11	8	5	12
9	10	8	9	6	10
10	11	1	10	7	18
11	12	4	11	8	13
12	13	6	12	9	11
			13	10	10
			14	11	4
			15	12	2
			16	13	1
			17	14	0
			18	15	1
No. of Individuals . .		63	No. of individuals . .		97
Mean = 7°·9841. Standard deviation = 2°·9479. Coefficient of variation = 36·931.			Mean = 7°·0000. Standard deviation = 2°·9290. Coefficient of variation = 41·843.		

TABLE XII.

The angle of obliquity in "pairs" of humeri.

Side.	Male (33 pairs).			Female (51 pairs).		
	Mean.	σ.	ν.	Mean.	σ.	ν.
R. . . .	7°·4545	2°·9832	40·019	6°·7451	2°·7231	40·372
L. . . .	7·7879	2·6112	33·530	6·8039	2·8441	41·801

The angles for the right and left humeri of the same skeleton are generally similar to each other. There is no appreciable difference between the means of the two sides. Out of 33 male pairs, there were 5 pairs (15·1 per cent.) in which the angles

differed from each other by less than a quarter of a degree. The mean of the differences between the right and left bones of the whole series was 1° 49′. Out of 51 female pairs, there were also 5 pairs (9·8 per cent.) with the angles differing from each other by less than the above amount, and the mean of the differences was 1° 43′.

There would appear to be only a very weak correlation between this angle of the humerus and the similar angle of the femur. (Table XIII.)

From the same table it will be seen that the angle tends to be larger in long than in short humeri.

TABLE XIII.

Pairs of dimensions.	Sex.	No.	*r*.	Probable error of *r*.
Angle of R. humerus and angle of R. femur	♀	51	0·0926	0·0829
Angle of R. humerus and maximum length of R. humerus	♀	97	0·2212	0·0636

THE RADIUS.

On these bones, two measurements were taken; the maximum length in the long axis of the bone, and the distance between the points where the longitudinal axis intersects the articular surfaces.* The details are given in Table XIV. The ratio curve obtained by expressing the radius in terms of the tibia is remarkably symmetrical for such a small number of observations. (Diagram IV.) The critical function of the curve is negative, and consequently we have a limited range; this was calculated, and it was found to be 14·91 units. The observed range was 11 units, and this is not far removed from the theoretical range.

Like the humerus, the radius of the right side was longer than that of the left. The following scheme gives the relations which were observed between the right and left bones of "pairs" of radii.

Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. bones.	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Per-centage.	No. of pairs with the R. bones greater than the L.	Per-centage.	Average pre-ponderance of R. over L.	No. of pairs with the L. bones greater than the R.	Per-centage.	Average pre-ponderance of L. over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Radius† (c. to c.)	♂	21	+2·03	1	4·8	15	71·4	3·45	5	23·8	1·80
	♀	27	+3·05	6	22·2	23	85·1	3·65	3	11·1	0·53

* I sometimes refer to this measure by the abbreviation (c. to c.), although the distal point is not quite the centre of the articular surface.

† See the notes referred to in the table of the femur.

TABLE XIV.

R. radius, measured from centre to centre of articular surfaces.						R. radius, measurements expressed in thousandths of tibia length.		
Male series.			Female series.			Sexes mixed.		
Units = 4 millims.	Absolute measures in millims.	Frequency.	Units = 4 millims.	Absolute measures in millims.	Frequency.	Units = 0·008 of tibia-length.	Thousandths of tibia.	Frequency.
1	209–212	1	1	203–206	4	1	594–601	1
2	213–216	0	2	207–210	7	2	602–609	3
3	217–220	0	3	211–214	8	3	610–617	4
4	221–224	1	4	215–218	8	4	618–625	14
5	225–228	2	5	219–222	10	5	626–633	14
6	229–232	4	6	223–226	15	6	634–641	17
7	233–236	4	7	227–230	4	7	642–649	14
8	237–240	8	8	231–234	2	8	650–657	14
9	241–244	9	9	235–238	3	9	658–665	7
10	245–248	5	10	239–242	1	10	666–673	6
11	249–252	3	11	243–246	2	11	674–681	3
12	253–256	4	12	247–250	2			
13	257–260	1						
14	261–264	2						
15	265–268	0						
16	269–272	2						
17	273–276	1						
No. of observations .		47	No. of observations .		66	No. of observations .		97
Centroid = 9·2128. $\mu_2 = 9·9512$. $\sigma = 3·1545$. $\mu_3 = 9·4045$. $\mu_4 = 348·3366$. $\beta_1 = 0·0897$. $\beta_2 = 3·5176$. Critical function = 0·766.			Centroid = 5·1667. $\mu_2 = 7·0934$. $\sigma = 2·6633$. $\mu_3 = 11·9714$. $\mu_4 = 160·8118$. $\beta_1 = 0·4015$. $\beta_2 = 3·1960$. Critical function = − 0·813.			Centroid = 6·3196. $\mu_2 = 5·0439$. $\sigma = 2·2454$. $\mu_3 = 0·6830$. $\mu_4 = 64·6901$. $\beta_1 = 0·0035$. $\beta_2 = 2·5427$. Critical function = − 0·925.		

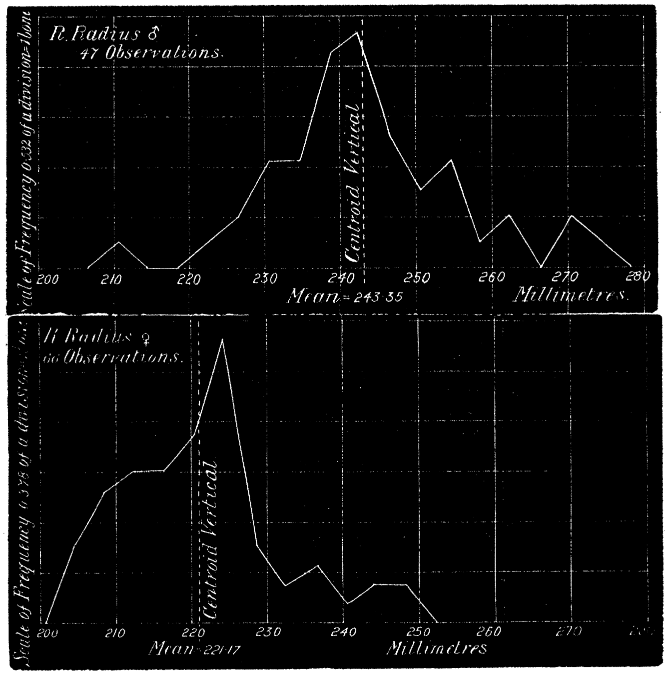
The constants of the L. radius (expressed in terms of tibia) are :—No. of observations 84, Observed range 589–684 thousandths, Centroid 5·3452, $\mu_2 = 6·1070$, $\sigma = 2·4712$, $\mu_3 = -1·5567$, $\mu_4 = 89·4063$, $\beta_1 = 0·0106$, $\beta_2 = 2·3972$, Critical function = − 1·2374. Theoretical range = 13·78.

As with all the other bones, greater asymmetry can be observed in woman than in man.

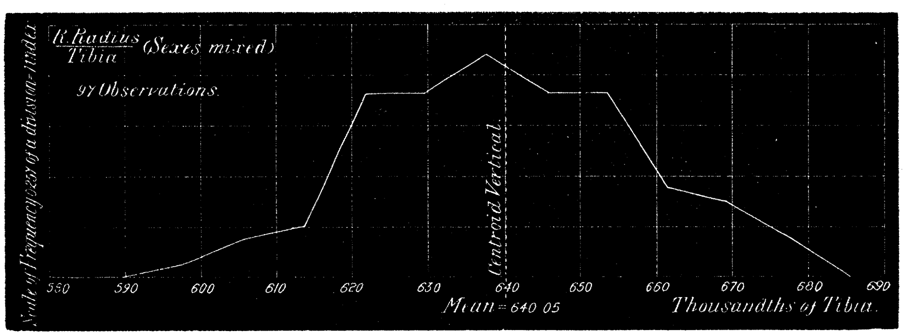
In the male the humerus + radius on the right side was, on the average, about 5·41 millims. longer than on the left, in the female it was about 8·78 millims. longer, and hence woman was approximately 3·37 millims. more asymmetrical than man.

In the case of the inferior extremity a similar though a less marked difference was found between the sexes; the female had a mean excess of about 0·72 millim. over the male asymmetry.

Diagram IV.



The above curves are reduced to the same area by adjusting the vertical scale.



The Ulna.

The measurements made on this bone were: the maximum length in the direction of the long axis, and the distance from the centre of the inferior articular surface to the point where the longitudinal axis cuts the surface of the olecranon.

This bone was remarkable in several respects. The olecranon was very variable in size, occasionally it was large and massive, but more often it was small in proportion to the length of the bone, and sometimes it was diminutive to an exceptional degree. The upper third of the bone in the majority of cases exhibited an anterior curvature. This curvature was strongly marked in 21·7 per cent. (see U. *r.* B. 114 in Plate 22). I noticed a tendency for a much curved ulna to occur with a platycnemic tibia and a pilastric femur.

It would seem then that, under certain circumstances, the limb-bones are so acted upon by a vigorous musculature that they assume these special forms.

The measurements are recorded in Table XV., the left ulna is given because it happened to constitute the larger series. There is a certain resemblance between these curves and those of the radius, and this is especially the case with the ratio-curve where the length of the ulna is expressed in terms of the length of the tibia. In this curve the critical function is negative and the theoretical range is 18·29 units, and this is not very different from the observed range (13 units). A similar result was obtained for the radius.

TABLE XV.

L. ulna. The styloid process is excluded.						R. ulna. The measurements are expressed in thousandths of tibia length.		
Male series.			Female series.			Sexes mixed.		
Units = 4 millims.	Absolute measures in millims.	Frequency.	Units = 4 millims.	Absolute measures in millims.	Frequency.	Units = 0·008 of tibia-length.	Thousandths of tibia.	Frequency.
1	228–231	1	1	199–202	1	1	668–675	1
2	232–235	0	2	203–206	0	2	676–683	2
3	236–239	1	3	207–210	0	3	684–691	7
4	240–243	0	4	211–214	0	4	692–699	4
5	244–247	0	5	215–218	0	5	700–707	4
6	248–251	1	6	219–222	1	6	708–715	9
7	252–255	3	7	223–226	2	7	716–723	15
8	256–259	3	8	227–230	2	8	724–731	14
9	260–263	5	9	231–234	7	9	732–739	8
10	264–267	1	10	235–238	6	10	740–747	7
11	268–271	6	11	239–242	10	11	748–755	5
12	272–275	4	12	243–246	7	12	756–763	0
13	276–279	5	13	247–250	10	13	764–771	1
14	280–283	3	14	251–254	6			
15	284–287	1	15	255–258	5			
16	288–291	5	16	259–262	0			
17	292–295	1	17	263–266	2			
18	296–299	0	18	267–270	3			
19	300–303	1	19	271–274	1			
			20	275–278	2			
			21	279–282	0			
			22	283–286	1			
No. of observations .		41	No. of observations .		66	No. of observations .		77
Centroid = 11·2683. $\mu_2 =$ 14·1678. $\sigma =$ 3·7640. $\mu_3 = -$ 21·2642. $\mu_4 =$ 638·4700. $\beta_1 =$ 0·1590. $\beta_2 =$ 3·1808. Critical function = − 0·115.			Centroid = 12·3030. $\mu_2 =$ 12·9536. $\sigma =$ 3·5991. $\mu_3 =$ 7·8225. $\mu_4 =$ 535·9122. $\beta_1 =$ 0·0281. $\beta_2 =$ 3·1938. Critical function = 0·303.			Centroid = 7·0519. $\mu_2 =$ 6·4497. $\sigma =$ 2·5396. $\mu_3 = -$ 4·3559. $\mu_4 =$ 111·3089. $\beta_1 =$ 0·0706. $\beta_2 =$ 2·6758. Critical function = − 0·860.		

The relationship between the "sides" is shown in the following scheme :—

Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. sides.	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Percentage.	No. of pairs with the R. bones greater than the L.	Percentage.	Average preponderance of R. over L.	No. of pairs with the L. bones greater than the R.	Percentage.	Average preponderance of L over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Ulna (2nd measurement)	♂	21	+1·95	0	0	17	80·9	2·72	4	19·0	1·28
	♀	28	+2·35	0	0	22	78·6	3·75	6	21·4	2·77

Here, again, we notice that the mean excess is greater in the female than in the male.

The Clavicle.

The length of this bone, as we have previously seen, is highly variable. Some of the clavicles were strongly curved, but every transition occurred from an almost straight bone to one bent into the shape of an S. If we can form any opinion from the small number of pairs which were available we may say that the left clavicle tends to be longer than the right, while the left arm, as was shown above, is considerably shorter than the right. This relation, however, would appear to be much less constant in the clavicle than in the limb-bones.

Bone.	Sex.	No. of pairs.	Difference between the means of the R. and L. bones.	No. of pairs with the R. and L. bones differing from one another by less than 1 millim.	Percentage.	No. of pairs with the R. bones greater than the L.	Percentage.	Average preponderance of R. over L.	No. of pairs with the L. bones greater than the R.	Percentage.	Average preponderance of L. over R.
			millims.		per cent.		per cent.	millims.		per cent.	millims.
Clavicle (maximum)	♂	19	−1·63	1	11·1	4	44·4	3·38	4	44·4	7·05
	♀	17	−1·40	6	35·3	3	17·6	1·53	11	64·7	2·59

According to these scant data the clavicle differs from the limb-bones in that the male has a greater mean excess than the female.

The Proportional Lengths of the Limb-Bones—Indices.

An index is a number which expresses the length of one dimension in terms of some other dimension measured on the same individual. Thus the absolute length disappears from consideration, and we have simply to deal with the varying proportion which the first dimension bears to the second.

I have already made use of indices in the case of each bone when the sexes were mixed. The curves thus obtained expressed the distribution of deviations about the mean ratio. These curves will be either simple or compound, according to whether the lengths of the bones in proportion to one another have the same or different means and standard deviations in the two sexes.

In Table XVI. are given most of the indices which have been suggested by different observers. The indices are of two kinds. From Table I. we can construct the limbs of a mean-man and of a mean-woman ; the indices of these mean-individuals were then calculated, and they are thus indicated in the table. By such a method we can obtain no idea of the variability of the index. But we require to know what this variation is : for this purpose the index of each individual has been calculated separately, and so a series of indices are formed from which measures of variability may be obtained. The mean of the series will thus be the mean of the indices. In obtaining the series the question of "side" was disregarded. Strictly, this ought not to have been neglected, and especially is this the case with the bones of the arm, but it would have been impossible to have formed a sufficiently large series if this had not been done, on account of the fragmentary condition of the skeletons.

The standard deviation of one index is not necessarily comparable with that of another, for the standard dimension selected often differs in the various indices. On the other hand, the ratio-measures of variation (coefficients of variation) are comparable.

If we look down the two columns of coefficients, the one for the male and the other for the female, we shall see that the intermembral index is the least variable and the claviculo-humeral index the most variable in both sexes, and the female is somewhat more variable than the male. Of the intermediate indices the tibio-femoral, the humero-femoral, and the radio-humeral are more variable, and the radio-crural and humero-crural are less variable in woman than in man.

On the whole, then, we see that the relative proportions of the limb-bones are less constant in woman than in man, and so we should judge that the correlation between the bones would be less in the female than in the male, and this is exactly what we shall find when we come to consider the correlations.

Several varieties of the indices of the mean-individual are given. These were added to show the difference which is produced by measuring the lengths of the bones in different ways.

There is no doubt that for most purposes these numbers could be used for the conversion of indices, as obtained by different observers, into a comparable form, for it is doubtful whether race-differences would appreciably affect the relation between the various length-dimensions which have been adopted by different anatomists.

Having thus discussed the variability of the indices (and this, perhaps, is not very different in the various races), we will now turn to the actual mean values which have been determined, that is, to the ethnological side of the subject.

TABLE XVI.

Index.	Males.	Index of mean-man, and mean of indices.	Standard deviation.	Co-efficient of variation.	Females.	Index of mean-woman, and mean of indices.	Standard deviation.	Co-efficient of variation.
INTERMEMBRAL INDEX.								
$\frac{\text{H. (oblique) + R. (centre to centre)}}{\text{F. (oblique) + T. (centre to centre)}}$	Mean-man	68·849			Mean-woman	68·239		
$\frac{\text{H. (oblique) + R. (maximum)}}{\text{F. (oblique) + T. (centre to centre)}}$	Mean-man	70·508			Mean-woman	69·839		
$\frac{\text{H. (maximum) + R. (maximum)}}{\text{F. (maximum) + T. (centre to centre)}}$	27 Mean-man	70·587 70·730	1·514	2·133	50 Mean-woman	70·038 69·812	1·621	2·314
TIBIO-FEMORAL INDEX.								
$\frac{\text{T. (centre to centre)}}{\text{F. (oblique)}}$	Mean-man	80·090			Mean-woman	79·518		
$\frac{\text{T. (centre to centre)}}{\text{F. (maximum)}}$	86 Mean-man	79·808 79·506	1·970	2·469	109 Mean-woman	78·518 78·751	1·957	2·493
HUMERO-FEMORAL INDEX.								
$\frac{\text{H. (maximum)}}{\text{F. (maximum)}}$	Mean-man	71·016			Mean-woman	70·062		
$\frac{\text{H. (maximum)}}{\text{F. (oblique)}}$	Mean-man	71·538			Mean-woman	70·747		
$\frac{\text{H. (oblique)}}{\text{F. (oblique)}}$	48 Mean-man	70·712 70·618	2·022	2·860	75 Mean-woman	69·996 70·112	2·181	3·116

TABLE XVI—(continued).

Index.	Males.	Index of mean-man, and mean of indices.	Standard deviation.	Co-efficient of variation.	Females.	Index of mean-woman, and mean of indices.	Standard deviation.	Co-efficient of variation.
RADIO-HUMERAL INDEX.								
$\frac{\text{R. (centre to centre)}}{\text{H. (oblique)}}$	Mean-man	75·579			Mean-woman	74·725		
$\frac{\text{R. (maximum)}}{\text{H. (maximum)}}$	34 Mean-man	79·462 78·782	2·145	2·700	65 Mean-woman	77·867 78·113	2·273	2·920
RADIO-CRURAL INDEX.								
$\frac{\text{R. (centre to centre)}}{\text{F. (oblique) + T. (centre to centre)}}$	Mean-man	29·636			Mean-woman	29·184		
$\frac{\text{R. (maximum)}}{\text{F. (oblique) + T. (centre to centre)}}$	Mean-man	31·295			Mean-woman	30·783		
$\frac{\text{R. (maximum)}}{\text{F. (maximum) + T. (centre to centre)}}$	38 Mean-man	31·171 31·046	0·832	2·668	54 Mean-woman	30·735 30·617	0·727	2·366
HUMERO-CRURAL INDEX.								
$\frac{\text{H. (oblique)}}{\text{F. (oblique) + T. (centre to centre)}}$	Mean-man	39·213			Mean-woman	39·055		
$\frac{\text{H. (maximum)}}{\text{F. (maximum) + T. (centre to centre)}}$	49 Mean-man	39·412 39·562	1·172	2·974	72 Mean-woman	39·058 39·195	1·128	2·888
CLAVICULO-HUMERAL INDEX.								
$\frac{\text{Cl. (maximum)}}{\text{H. (oblique)}}$	Mean-man	47·162			Mean-woman	46·239		
$\frac{\text{Cl. (maximum)}}{\text{H. (maximum)}}$	19 Mean-man	46·734 46·555	1·990	4·258	29 Mean-woman	46·460 45·824	2·127	4·580

F. = Femur. T. = Tibia. H. = Humerus. R. = Radius. Cl. = Clavicle. The indices are multiplied by 100.

(1.) *The Intermembral Index.*

The upper limb, in proportion to the lower limb, is longer in man than in woman. In the data given by TURNER this index was calculated from the maximum length of the bones, except in the case of the tibia, where the spine was excluded. The indices of our mean-man and mean-woman, found from corresponding measurements, are 69·55 and 68·56 respectively. The mean index given for Europeans is 69·5, and a similar index is assigned to Mongolians, Malays, natives of India, &c.

(2.) *The Tibio-femoral Index.*

The tibia, in proportion to the femur, is shorter in woman than in man. The mean indices (the maximum length of the femur was taken and the spine was excluded from the tibia) are 82·67 for the male and 82·06 for the female. TOPINARD gives 81·1 as the mean of 55 European men, and 80·8 as the mean of 17 European women. To judge from some rather divergent results of different authors, Negroes would appear to have a mean index of about 84.

The value of this index varies much in the different races. TURNER gives the index 83 "as marking the division between proportionally long-legged ('dolichoknemic') and short-legged races ('brachyknemic')." According to this, the New Race were brachyknemic, and under this division are included Europeans, Chinese, Esquimaux, &c.

(3.) *The Humero-femoral Index.*

The length of the humerus, in proportion to that of the femur, is greater in man than in woman. Our indices for maximum humerus and maximum femur are 71·02 for the men and 70·06 for the women. Here the New Race diverge from the Europeans (index = 72·5) and resemble the black races (Negroes have an index = 71·3) where the humerus, in proportion to the femur, is shorter than in Europeans.

(4.) *The Radio-humeral Index.*

The length of the radius, in proportion to that of the humerus, is greater in man than in woman. For the maximum length of both bones the male index of the New Race was 78·78 and the female 78·11.

From 55 European male skeletons TOPINARD obtained a mean index 73·0, and from 26 female skeletons an index 72·4.

Sir WILLIAM TURNER divides the different races into three groups according to the value of this index. He applies the term *brachykerkic* to those races which have an index below 75 (such as Europeans, Lapps, &c.), *mesatikerkic* to those with an index between 75–79 (Australians, Negroes, American Indians, &c.), and *dolichokerkic*

to those with an index of 80 and upwards (Andaman Islanders, Fuegians). Following this classification the New Race belongs to the bottom of the mesatikerkic division, which includes the black races and some yellow races.

(5.) *The Claviculo-humeral Index.*

In the New Race the relative length of the clavicle to the humerus would appear to be slightly greater in man than in woman. But M. PAUL BROCA has measured 9 Negroes and 7 Negresses, and the indices were 45·8 and 47·4 respectively, while in 5 European men and 4 women they were 44·3 and 45·0 respectively. In the case of the New Race the mean of the indices of 19 men was 46·73 and of 29 women 46·46. Here again, as in the radius, the New Race approached the Negro. To judge from TURNER'S measurements very considerable differences appear to occur in the value of this index for different races, and this author is inclined to think that the relation is too indefinite to form a race-character. Such we should expect from the highly variable nature of the clavicle, in fact, the coefficient of variation of this bone is much higher than that of any of the limb-bones.

(6.) *The Radio-crural and Humero-crural Indices.*

The indices which I have so named, indicate that both the radius and the humerus are longer in proportion to the femur + tibia in man than in woman. Below is a table quoted from TOPINARD, and derived from the measurements made by BROCA, on some 9–15 skeletons. In the third column are inserted the indices for the New Race.

Index.	Europeans.	New Race.	Negroes.
Humerus + radius : femur + tibia = 100	69·73	69·05	68·27
Radius : humerus = 100	73·93	78·45	79·40
Radius : femur + tibia = 100	29·54	30·34	30·38
Humerus : femur + tibia = 100 . . .	40·11	38·64	38·20
Clavicle : humerus = 100	44·63	46·19	46·74

In this table the sexes are mixed.

The values for the New Race lie in every case between the values given for Europeans and Negroes, but generally much nearer the latter than the former.

THE CORRELATION OF THE LENGTHS OF THE BONES.

By "correlation" we mean the relation which exists between two or more "effects," such that when the "cause" of variation produces a certain deviation from the mean of one effect then a simultaneous deviation is observed in all the other effects.

Take the case of two bones of the lower extremity. Let us suppose that a certain cause or system of causes acting on a group of still growing femora ultimately produces in them an average deviation from the mean length of femora in general. We then require to know what average deviation in the length of the tibiæ, say, is associated with this abnormal group of femora, that is, how the cause of variation in the group of femora influences the mean length of the tibiæ. Of course, we may state the problem in the reverse manner, and say that we require to know how the cause of variation in a group of tibiæ affects the mean length of the femora.

The causes, which are generally altogether unknown, need not necessarily be regarded. We have simply to deal with the effects and to express in a numerical manner the relation which is observed between them.

The application of a measure which will express the relation existing between two correlated organs is due to Mr. GALTON. A group of dimensions is chosen in which one organ varies between narrow and fixed limits. Now if the average deviation of this group from the general mean of the organ be expressed in terms of an absolute measure of variability of that organ, and if the observed associated mean deviation of the second organ be similarly expressed in terms of its variability, then the ratio of the latter to the former is practically constant, whatever group may be selected. This is only strictly true when the distribution of deviations follows the normal law.

This fraction (known as r) is the measure we require, for if the mean deviation of the first organ ("the subject") involves an equal (*i.e.*, "equal" in proportion to the variability of the organ) average deviation in the second ("the relative"), then our ratio becomes unity. As it involves less and less deviation in the second organ, the numerator of the fraction gradually approaches zero, and the constant r can thus have any value from ± 1 to 0.

The best method of determining r is by means of the formula $r = \frac{\Sigma xy}{n\sigma_1\sigma_2}$, which we have already explained. By the use of this formula the whole of the observations are taken into account. Having found r, we see, as before, that if $\mathrm{D} =$ the average deviation from the mean of a group of femora, then the associated mean deviation of the tibiæ, say, will be equal to $r \frac{\sigma_2}{\sigma_1} \mathrm{D}$, where σ_1, σ_2, are the standard deviations of femur and tibia respectively. The dispersion of these tibiæ about their mean will be measured by the standard deviation $\sigma_2 \sqrt{1 - r^2}$.

With respect to the dimensions of organisms, there are two problems which require to be solved, namely (1) the form of distribution of the *absolute variations* and (2) that of the *index variations*, and corresponding to these the *absolute correlations* and the *index correlations*. These are two quite distinct aspects of the question.

Suppose we had a series of men ranging in stature from pigmies to giants, and that they were all perfect models of one another, then the *absolute variation* of any bone would possess an extensive range, and the frequencies could be expressed by

some form of curve; while the *absolute correlation* for every pair of bones would be expressed by unity. But let us take stature as the standard, and refer the measures to it; we shall then find no variation, and so the *index variation* and the *index correlation* are zero.

Next, suppose that we had a series of men of identical stature, but that the bones varied considerably in relation to one another. Here, since the standard is constant, the absolute variation would give the same curve as the index variation, and the absolute and index correlations must also be the same.

If we suppose in our former series ranging from pigmies to giants that the individuals were nearly, but not quite, perfect models of one another, then the absolute variations would have an extensive range, and the coefficients of correlation must still be high. The index variations would possess a small range, while the index coefficients of correlation might be either high or low.

If the individuals are supposed to only roughly resemble one another, then the absolute variations would give one form of frequency curve, while the index variations would very possibly give a quite different kind of curve, for the abnormal bones with respect to stature would be placed in their appropriate places towards either end of the series, while, of course, in the absolute series these bones might have been perfectly average ones. Similarly the absolute and index coefficients of correlation need not resemble one another, and there is no means of saying, *à priori*, whether the latter would be higher or lower than the former.

The absolute correlation of pairs of bones will give us a measure of how the bones in general are associated together, and this without reference to any particular standard we may wish to institute for the individual.

The form of frequency curve given by indices will partly depend upon the selected standard. The standard to which the organs are referred will be different according to the purpose we have in view. In the case of organisms that are still growing, we are unable to deal with the absolute measures, and we ought to select a standard which will represent as correctly as possible the stage of growth at which the animal has arrived.

When growth has ceased the significance of index variation and index correlation will depend upon the standard which is chosen. Here we shall generally require a dimension which stands in some functional relation to the organs; for example, tall men would find it very inconvenient to have exceptionally short arms, and so stature would be a suitable standard to which the bones of the arm might be referred. In this example, then, a correlation between the indices $\frac{\text{Length of arm}}{\text{Stature*}}$, $\frac{\text{Length of leg}}{\text{Stature*}}$, is intended to answer such a question as: What relative length of leg to stature will

* The length of the vertebral axis would be better, so as to avoid the incidental correlation due to the length of the leg.

a man probably have when his arm, in proportion to stature, varies by a certain amount?

Professor PEARSON has recently pointed out that if the bones were supposed to be sorted into skeletons absolutely at random, still a correlation would occur between the indices. The value thus obtained is called the "spurious correlation," and it would appear to be measured by the expression $\dfrac{v_3^2}{\sqrt{v_1^2 + v_3^2}\sqrt{v_2^2 + v_3^2}}$, where v_1, v_2, v_3, are the coefficients of variation of the two correlated dimensions and of the standard respectively. If ρ is the coefficient of correlation obtained from the actual indices, and ρ_0 is the "spurious correlation," the question arises as to whether any meaning can be assigned to the expression $\rho - \rho_0$. Professor PEARSON is inclined to think that this expression gives the intensity of "organic correlation," as distinguished from the observed correlation.

The Absolute Correlations.

In Table XVII. are given the coefficients of correlation of pairs of bones for the male and female series.

The correlation of right and left bones is seen to be slightly less in the female than in the male in the case of the femur and tibia, but the right and left humerus and the right and left radius are perhaps somewhat more closely correlated in the female than in the male. Thus, with regard to right and left correlation, the female would seem to be more closely correlated than the male in the upper extremity, but less so in the lower. In every other case the coefficients of correlation are conspicuously greater in the male than in the female. The mean of the sexual ratios (♂/♀) of the correlations is 1·068.

The femur and tibia are very closely correlated; the former in the male would appear to be about equally correlated with the humerus and radius, but on comparing the male and female series it may perhaps be said that the femur is slightly less correlated with the radius than with the humerus. In the case of the tibia, on the other hand, there is apparently a somewhat stronger correlation with the radius than with the humerus. Perhaps we ought to expect this from the fact that the femur and humerus, and the tibia and radius, are serially homologous.

Everywhere, except in the case of the humerus and radius, the maximum length of the humerus is seen to be a little more strongly correlated with the other bones than is the oblique length of the humerus. Both in the male and female series the oblique length of the humerus is the dimension which is the more closely correlated with the radius. I have already suggested the reason for this in discussing the relation between the two lengths of the humerus.

In all these correlations, when a right bone was not present a left was taken. This, in the case of the arm-bones, is scarcely legitimate, as we can see from the

TABLE XVII.

Pairs of bones.	Male series.			Female series.		
	No. of individuals.	r.	Probable error of r.	No. of individuals.	r.	Probable error of r.
R. femur and L. femur (oblique)	48	0·9765	0·0032	66	0·9618	0·0045
Femur (oblique) and tibia (centre to centre)	88	0·9164	0·0085	116	0·8487	0·0133
,, ,, humerus (maximum)	63	0·8416	0·0190	98	0·7815	0·0209
,, ,, ,, (oblique)	63	0·8330	0·0200	98	0·7680	0·0222
,, ,, radius (centre to centre)	42	0·8465	0·0225	64	0·7014	0·0351
R. tibia and L. tibia (centre to centre)	63	0·9634	0·0044	100	0·9505	0·0047
Tibia (centre to centre) and humerus (maximum)	74	0·8497	0·0155	96	0·7842	0·0208
,, ,, ,, ,, (oblique)	74	0·8396	0·0164	96	0·7835	0·0209
,, ,, ,, radius (centre to centre)	57	0·8505	0·0188	76	0·8078	0·0209
R. humerus and L. humerus (maximum)	33	0·9454	0·0091	52	0·9643	0·0047
,, ,, ,, (oblique)	33	0·9284	0·0119	52	0·9551	0·0059
Humerus (maximum) and radius (centre to centre)	50	0·8232	0·0237	78	0·7745	0·0241
,, (oblique) and radius (centre to centre)	50	0·8487	0·0203	78	0·7887	0·0227
R. humerus (oblique) and R. radius (centre to centre)	24	0·8605	0·0271	35	0·8185	0·0291
R. radius and L. radius (centre to centre)	21	0·9246	0·0157	27	0·9322	0·0124
Clavicles (maximum) and humerus (oblique)	35	0·6767	0·0512	42	0·5349	0·0655

		No. of individuals.	r.	Probable error of r.
Sexes mixed	R. clavicle and L. clavicle (maximum)	32	0·9317	0·0115
	Clavicle and infraspinous index	20	0·3630	0·1231

Mean of the sexual ratios $\left(\frac{♂}{♀}\right)$ of all the correlations $= 1·068$.

example, where the R. humerus is correlated with the R. radius. This can readily be understood from the considerable asymmetry which was found between the arm-bones of the two sides. If "side" had been regarded throughout the series, the number of available bones would have been so much reduced that I considered it best to disregard this source of error altogether, but it should be borne in mind that in the correlations of the bones of the arm the coefficients are slightly smaller than if the "side" of the bones could have been taken into account. Taking everything into consideration, however, the bones of the lower extremity (the femur and tibia) would appear to be distinctly more strongly correlated than are the corresponding bones of the arm (the humerus and radius). It is remarkable that the femur and tibia should be about as strongly correlated with the humerus and the radius as the latter bones are with each other.

The length of the clavicle and the proportional breadth of the scapula to the infraspinous length would seem to be slightly correlated, but the probable error of the coefficient is here very large, and hence little reliance can be placed on the actual value obtained.

The Index Correlations.

The significance of these correlations has already been discussed. The standards which were instituted were not very satisfactory. Undoubtedly stature (or rather the length of the vertebral axis) would have been the best, but, of course, this was not available. Consequently it was necessary to take one bone as the standard, and to express pairs of other bones in terms of it. Whenever possible the length of the tibia, excluding the spine, was selected.

The results which have been obtained are given in Table XVIII. Besides the coefficients of correlation* (ρ), I have added the "spurious correlations" (ρ_0) which were determined by Professor PEARSON's formula. This formula has already been mentioned. In the last column to the right the value $\rho - \rho_0$ is shown. As an example, let us take the first pair of indices given in the table. The probable deviation from the mean of the ratio $\frac{\text{L. femur}}{\text{Tibia}}$ associated with a known deviation (D) of the ratio $\frac{\text{R. femur}}{\text{Tibia}}$ is given by $\rho \frac{\sigma_2}{\sigma_1} \text{D} = \cdot 9 \frac{2 \cdot 48}{2 \cdot 57} \text{D}$, but whether the "organic correlation" between the indices is represented by $\rho - \rho_0 = \cdot 342$ rather than by $\rho = \cdot 9$ is an open question.

Confining ourselves to the actually observed correlations of the ratios, we see that many of the coefficients differ very widely from those obtained from the absolute measures. In nearly every case they are distinctly lower. No uniform difference between the correlations of the male and female can be detected. One point, however, comes out very clearly: the femur and humerus expressed in terms of the tibia are more strongly correlated than the femur and radius referred to the same standard. This was less distinctly shown in the absolute correlations. Also the tibia and radius, with the humerus as the standard, are more closely correlated than the tibia and the humerus expressed in terms of the femur, and with the absolute correlations similar results were obtained. According to the expressions $\rho - \rho_0$, this condition of things is reversed.

The Correlation of Homologous Parts.

Since the foregoing was written I have been enabled to test the hypothesis of the closer correlation of homologous parts by a comparison with two other races, the Aino and the French. This has been possible through the great kindness of Miss

* These were found by the direct correlation of the ratios.

TABLE XVIII.

	Pairs of indices.								No. of observation.	Coefficient of correlation ρ.	Probable error of ρ.	"Spurious correlation" ρ_0.	$\rho - \rho_0$.
Sex.	Index.	Mean.	Standard deviation.	Coefficient of variation.	Index.	Mean.	Standard deviation.	Coefficient of variation.					
♂	$\frac{\text{R. femur (oblique)}}{\text{Tibia + malleolus}}$	119·685	2·574	2·151	$\frac{\text{L. femur (oblique)}}{\text{Tibia + malleolus}}$	119·789	2·484	2·073	43	0·900	0·0145	0·558	0·342
♀	,,	121·362	2·829	2·331	,,	121·700	2·870	2·359	64	0·912	0·0123	0·554	0·358
♂	$\frac{\text{Femur (oblique)}}{\text{Humerus (oblique)}}$	142·473	4·456	3·127	$\frac{\text{Tibia (centre to centre)}}{\text{Humerus (oblique)}}$	114·279	3·991	3·493	52	0·749	0·0329	0·442	0·307
♀	,,	143·596	4·387	3·055	,,	113·730	3·856	3·390	73	0·624	0·0408	0·443	0·181
♂	$\frac{\text{Femur (oblique)}}{\text{Tibia + malleolus}}$	119·680	2·662	2·224	$\frac{\text{Humerus (oblique)}}{\text{Tibia + malleolus}}$	84·215	2·558	3·038	47	0·439	0·0727	0·526	−0·087
♀	,,	121·520	3·248	2·673	,,	84·903	2·670	3·145	74	0·407	0·0606	0·576	−0·169
♂	$\frac{\text{Femur (oblique)}}{\text{Tibia + malleolus}}$	120·053	2·567	2·138	$\frac{\text{Radius (centre to centre)}}{\text{Tibia + malleolus}}$	63·936	1·775	2·776	37	0·287	0·0978	0·514	−0·227
♀	,,	121·634	3·167	2·603	,,	63·583	1·727	2·716	57	0·330	0·0756	0·524	−0·194
♂	$\frac{\text{R. tibia (centre to centre)}}{\text{Femur (oblique)}}$	80·163	1·850	2·308	$\frac{\text{L. tibia (centre to centre)}}{\text{Femur (oblique)}}$	80·302	1·699	2·116	49	0·908	0·0125	0·479	0·429
♀	,,	79·350	2·072	2·612	,,	79·625	2·019	2·535	76	0·947	0·0058	0·444	0·503

TABLE XVIII. (continued).

Sex.	Pairs of indices. Index.	Mean.	Standard deviation.	Coefficient of variation.	Index.	Mean.	Standard deviation.	Coefficient of variation.	No. of observation.	Coefficient of correlation ρ.	Probable error of ρ.	"Spurious correlation" ρ_0.	$\rho - \rho_0$.
♂	Tibia (centre to centre) / Femur (oblique)	80·400	1·747	2·170	Humerus (oblique) / Femur (oblique)	70·712	2·022	2·860	48	0·083	0·0963	0·488	−0·405
♀	"	79·134	2·169	2·741	"	69·996	2·181	3·116	75	0·341	0·0651	0·464	−0·123
♂	Tibia (centre to centre) / Humerus (oblique)	113·601	3·361	2·958	Radius (centre to centre) / Humerus (oblique)	75·753	1·893	2·499	37	0·476	0·0774	0·437	0·039
♀	"	113·186	3·495	3·088	"	74·709	2·091	2·785	63	0·564	0·0505	0·470	0·093
♀	R. humerus (oblique) / Tibia + malleolus	85·570	2·640	3·085	L. humerus (oblique) / Tibia + malleolus	83·703	2·642	3·156	37	0·950	0·0078	0·572	0·378
♀	Humerus (oblique) / Tibia + malleolus	85·233	2·547	2·988	Radius (centre to centre) / Tibia + malleolus	63·637	1·769	2·786	60	0·559	0·052	0·457	0·102
Sexes mixed	R. radius (centre to centre) / Tibia + malleolus	63·999	1·964	3·070	L. radius (centre to centre) / Tibia + malleolus	63·313	1·957	3·092	41	0·902	0·0146	0·468	0·434
♀	Clavicle / Tibia + malleolus	39·735	2·078	5·229	Humerus (oblique) / Tibia + malleolus	84·990	2·460	2·895	42	0·419	0·0791	0·522	−0·103
Sexes mixed	"	40·143	2·041	5·084	"	85·300	2·609	3·058	68	0·423	0·0618	..	..

ALICE LEE and Professor PEARSON, in allowing me to use the results which they have obtained in the correlation of the limb-bones of these two races.

In Table XVIIIA. we have a comparative view of the coefficients of correlation for the three races. From the column headed "Mean of the six r's" we can see that the femur and the tibia are more strongly correlated than the humerus and the radius. Also the femur and the humerus, which are homologous bones in the lower and upper extremities respectively, are distinctly more closely correlated than the femur and the radius, which are not serially homologous. Similarly the tibia and the radius would appear to be slightly more correlated than the tibia and the humerus. It will be noticed, however, that in the French this tendency for the closer correlation of homologous parts is not exhibited in the case of the correlations of the tibia.

Omitting the French and taking the means of the correlations of the other two races, we obtain the results given in the succeeding column of the table. The difference between the mean correlations of the femur and tibia and the humerus and radius is 8·1 per cent. of perfect correlation; the difference between the femur and humerus (homologous bones) and the femur and radius (non-homologous bones) is 7·8 per cent., while with the tibia and radius and the tibia and humerus the difference is only 4·1 per cent.

A much larger series would be necessary before any certain conclusions could be drawn, but the following suggestions are offered :—

(1.) The bones of the upper extremity are less correlated with one another than are the corresponding bones of the lower extremity; *e.g.*, the mean correlation of femur and tibia = 0·86, and of humerus and radius = 0·78.

(2.) Serially homologous bones tend to be more closely correlated than non-homologous bones, but perhaps this is less marked in civilised than in savage races.

(3.) Proximal bones would seem to be more correlated than distal bones; *e.g.*, the mean correlation of femur and humerus = 0·84, and of tibia and radius = 0·82.*

II. THE SACRUM.

It was previously stated that this bone was found to be useless for the determination of sex.

Many of the sacra were in such a fragmentary condition that nothing could be inferred from them.

There was considerable variation in the number of constituent vertebræ. Out of 264 sacra examined there were seven (2·65 per cent.) composed of four vertebræ, and in four more bones this was doubtfully the case. Of these eleven sacra six belonged to female skeletons, two to male skeletons, while the sex of the remaining three was

* I have not touched upon the comparative strength of the correlation in the three races, since Professor PEARSON is investigating this subject.

TABLE XVIIIA.

Absolute correlations.

Bones.*	Male.						Female.						Mean of the six r's.	Mean of the four r's, excluding the French.	‡
	Aino.		New Race.		French.		Aino.		New Race.		French.				
	No.	r.	No.	r.	No.	r.	No.	r.	No.	r.	No.	r.			
Femur and tibia	40	0·8266 ±0·0260†	88	0·9164 ±0·0085	50	0·8058 ±0·0261	24	0·8457 ±0·0299	116	0·8487 ±0·0133	50	0·8904 ±0·0148	0·8556	0·8593	0·0811
Humerus and radius . .	39	0·7763 ±0·0338	50	0·8232 ±0·0237	50	0·8451 ±0·0208	22	0·7386 ±0·0526	78	0·7745 ±0·0241	50	0·8515 ±0·0200	0 8015	0·7782	
Femur and humerus . .	42	0·8584 ±0·0208	63	0·8416 ±0·0190	50	0·8421 ±0·0212	23	0·8722 ±0·0254	98	0·7815 ±0·0209	50	0·8718 ±0·0173	0·8446	0·8384	0·0782
,, and radius . . .	37	0·7891 ±0·0328	42	0·8465 ±0·0225	50	0·7439 ±0·0341	22	0·7039 ±0·0593	64	0·7014 ±0·0351	50	0·7786 ±0·0296	0·7606	0·7602	
Tibia and radius . . .	35	0·8655 ±0·0216	57	0·8505 ±0·0188	50	0·7804 ±0·0294	21	0·7452 ±0·0525	76	0·8078 ±0·0209	50	0·8053 ±0·0261	0·8091	0·8173	0·0407
,, and humerus . . .	39	0·7447 ±0·0257	74	0·8497 ±0·0155	50	0·8601 ±0·0188	22	0·7277 ±0·0547	96	0·7842 ±0·0208	50	0·8180 ±0·0244	0·7974	0·7766	
Clavicle and humerus . .	34	0·4393 ±0·0855	35	0·6767 ±0·0512	..	..	20	0·6309 ±0·0768	42	0·5349 ±0·0655	..	..	..	0·5704	

* The length-measurements taken on the bones were not identical in the three races, but it is very improbable that this fact would alter the relations here observed—

In the Aino— Femur (maximum), tibia (centre to centre), humerus (maximum), radius (maximum), clavicle (maximum).
In the New Race— ,, (oblique), ,, ,, ,, (oblique), ,, (centre to centre), ,, ,,
In the French— ,, (maximum), ,, (excluding spine), ,, (maximum), ,, (maximum), ,, ,,

† These are the probable errors of r.

‡ The difference between the mean correlations obtained from the two savage races, the Aino and the New Race.

undetermined. In sixteen cases (6·06 per cent.) the sacrum was composed of six vertebræ, but as the rest of the vertebral column was incomplete, it was impossible to say whether this condition was attained by the fusion of the last lumbar or the first caudal. Here five were male, seven female, and the rest undetermined. There were also sixteen (6·06 per cent.) other sacra, composed of six vertebræ, but the most anterior one was imperfectly assimilated with the remaining five, and the sacrum exhibited two promontories (see Plate 22, fig. *S.* 1102). Of these, five were male and six female. In six cases (2·27 per cent.) there were five vertebræ, but the anterior one was similarly imperfectly assimilated with the remaining four; one belonged to a male skeleton, and three to female skeletons. In four cases (1·51 per cent.) the anterior vertebra was free on one side, while on the other side it was completely fused with the rest of the sacrum, and the auricular surface extended over it. The actual number of vertebræ in these sacra was undetermined, as every specimen was much damaged.

Many of the sacra exhibited a marked right and left asymmetry. Here it was observed that the auricular surface generally extended forwards unequally on either side. The sacra which possessed two promontories showed, as a rule, this asymmetry to a greater or less degree.

A very remarkable feature in the sacra was the frequency with which a completely open sacral canal occurred. In no less than eight cases (3·03 per cent.) was the canal widely open throughout its entire length, while in another case it was open except for the neural arch of the first sacral vertebra. In four cases the canal was open posteriorly from a half to two-thirds of its length. Of these thirteen sacra nine belonged to male skeletons, and two to female.

As far as can be judged from these comparatively few observations, it would appear that the female exhibits diminution in the number of constituent vertebræ more frequently than does the male, while, on the other hand, the open neural canal would seem to be an essentially male abnormality.

Dr. A. M. PATERSON* has examined 265 adult sacra of both sexes and of various races. He found only one specimen consisting of four vertebræ (0·37 per cent.), while increase above five vertebræ occurred in 35·46 per cent. In the New Race diminution to four vertebræ was found in 2·65 per cent. at least, while increase above five occurred in only 12·12 per cent. Thus the sacra of the New Race differed perceptibly from the collection examined by PATERSON. But it is impossible to know from this observer's material whether modern races differ among themselves in the proportional number of abnormal sacra. From our results it would seem probable that different races do vary very considerably in this respect, for it would be rash to admit that a tendency is here shown towards an elongation of the modern sacrum.

Dr PATERSON has drawn attention to the "sacral notch" as being a simian

* 'Trans. Roy. Dublin Soc.,' 1893.

character, and he found it in a considerable percentage of the sacra of certain races. The notch is occasioned by the second sacral vertebra being somewhat narrower from right to left than the first and third. There fits into this notch a protuberance of the ilium, and so the sacrum and the pelvic girdle are more firmly locked together. The sacral notch was not at all conspicuously exhibited in any of our sacra, though, in a few cases, traces of it could be observed.

THE MEASUREMENTS OF THE SACRUM.

Only the normal sacra, composed of five vertebræ, were measured. Two dimensions were taken, the length and the breadth.

The length was measured from the middle of the promontory to the middle of the ventral border of the fifth vertebra. The breadth was the greatest transverse diameter as measured by two parallel and vertical surfaces.

From these dimensions the ordinary sacral index was calculated $\frac{\text{Breadth} \times 100}{\text{Length}}$. The results are given in the accompanying table (XIX.).

Here we have the anomalous result of the male sacrum being relatively broader than the female bone. I attribute this to the great curvature which many of the male sacra exhibited, while a considerable number of the female sacra were nearly flat (see Plate 22, figs. *S.* 1212 ; *S.B.* 112). Such a curvature will reduce the "length" very appreciably, and so the sacral index will become high. It would appear to be a more satisfactory method to measure the "length" along the mid-line of the ventral concave surface, and then the effect of curvature would disappear from the index.

Little stress, however, can be placed on the actual difference observed between the means of the male and female series, for the probable error of the mean is over one-hundredth of "length" in each case. It will be noticed that woman is considerably more variable in the sacral index than man.

From Table XX. we see that the mean length of the sacrum in absolute measures is a trifle greater in the female than in the male, and this we can understand from the strong curvature of many of the male sacra and the comparative flatness of a considerable number of the female bones.

The breadth is a trustworthy measurement, and it will be seen that in absolute measures the female sacrum is very nearly as broad as the male, from which we may probably judge that if the "length" were measured along the curved surface, the female sacrum would be relatively broader than the male bone.

It would appear that length and breadth are more closely correlated in man than in woman.

Sir WILLIAM TURNER has divided the different races into the

(1.) *Dolichohieric*, with sacral index below 100 ; this is the most Simian group, and includes Kaffirs, Bushmen, &c.

TABLE XIX.

Sacral index $\frac{\text{Breadth}}{\text{Length}} \times 100$.

Male series.			Female series.		
Unit = 0·03 length.	Index.	Frequency.	Unit = 0·03 length.	Index.	Frequency.
1	96– 98	1	1	95– 97	3
2	99–101	2	2	98–100	1
3	102–104	1	3	101–103	5
4	105–107	0	4	104–106	3
5	108–110	8	5	107–109	4
6	111–113	2	6	110–112	3
7	114–116	4	7	113–115	8
8	117–119	5	8	116–118	6
9	120–122	4	9	119–121	3
10	123–125	2	10	122–124	4
11	126–128	0	11	125–127	2
12	129–131	2	12	128–130	0
13	132–134	0	13	131–133	1
14	135–137	0	14	134–136	0
15	138–140	0	15	137–139	0
16	141–143	1	16	140–142	0
			17	143–145	2
No. of individuals		32	No. of individuals		45
Mean . . . . = 115·000. Standard deviation . . = 9·357. Coefficient of variation = 8·137.			Mean . . . . = 113·667. Standard deviation . . = 10·798. Coefficient of variation = 9·499.		

TABLE XX.

The correlation of length and breadth of the sacrum.

Sex.	No.	Dimension.	Mean.	σ.	ν.	Dimension.	Mean.	σ.	ν.	r.	Probable error of r.
♂	32	Length	97·450	8·767	8·996	Breadth	110·931	6·001	5·410	0·4637	0·0741
♀	45	„	98·100	9·420	9·602	„	110·333	6·287	5·699	0·3126	0·0866

(2.) *Platyhieric,* with the index above 100. This group has been further divided into—

(*a*) *Subplatyhieric,* index 100–106, and including Australians, Negroes, Chinese, &c.

(*b*) *Platyhieric,* index over 106, including Europeans, Ancient Egyptians.

We now see that the New Race was strongly platyhieric; TURNER quotes 112·4 as the mean male index for Europeans, and 116·8 as the mean female index. We may hence conclude that, in this character, the New Race closely resembled modern Europeans.

III. THE SCAPULA.

Unfortunately, only a small number of these bones could be measured, as the scapula is a bone peculiarly liable to injury.

When possible, I measured in all cases the total length in a straight line from the superior to the inferior angle, the breadth from both the centre of glenoid cavity and from the middle point of its dorsal edge to the point where the spine meets the vertebral border. I also measured the distance of this latter point from the inferior angle = "infraspinous length."

From these measurements we can derive two indices:—

$$\text{The scapular index } \frac{\text{Breadth to border}}{\text{Length}} \times 100.$$

$$\text{The infraspinous index } \frac{\text{Breadth to border}}{\text{Infraspinous Length}} \times 100.$$

The indices which were found are given in Table XXI.; the sexes and "sides" are mixed.

It would appear, however, that the mixture of sexes is not wholly justifiable, as may be seen from Table XXII. Here the means are higher in the female than in the male, indicating a greater proportional breadth to the scapula in woman than in man.

Table XXIII. gives the details as to the correlation between the infraspinous length and breadth in 44 scapulæ. There is seen to be a distinct, though not a very strong, correlation between these two dimensions.

It is a rather remarkable fact that length and breadth seldom appear to be closely correlated. We found it so in the sacrum, it is also the case in skulls, and I feel satisfied by observation that such will be found to be true for the long bones.

The mean of the scapular index is 65·9, and of the infraspinous index 89·4. These results are surprisingly close to the mean values given for Europeans, which are 65·3 and 87·8 respectively.

We have seen that the question of sex ought not strictly to be neglected; it

would also seem that "side" should be taken into account. As far as we can judge from the few observations, it would appear that the means of total length and infra-spinous length are practically the same on the two sides, but in every case in which a pair occurred, both in male and female, the breadth was greater on the left side than on the right, and so corresponded to the greater mean length of left clavicle. The average preponderance in four men was 1·59 millim., and in four women 1·60 millim.

The angle which the axis of the spine made with the vertebral border was very variable. I approximately measured two of the extreme cases; the angle which the axis of the spine made with the anterior portion of vertebral border was 72° and 86°. On the whole it may be said that this "scapulo-spinal angle" was somewhat low for the New Race; the mean given for Europeans is 82°·5.*

TABLE XXI.

Scapular index.			Infraspinous index.		
Unit = 0·01 total length.	Index.	Frequency.	Unit = 0·02 infraspinous length.	Index.	Frequency.
1	57	1	1	74–75	2
2	58	0	2	76–77	2
3	59	0	3	78–79	2
4	60	1	4	80–81	3
5	61	1	5	82–83	0
6	62	1	6	84–85	7
7	63	0	7	86–87	3
8	64	3	8	88–89	5
9	65	1	9	90–91	3
10	66	2	10	92–93	2
11	67	3	11	94–95	3
12	68	2	12	96–97	4
13	69	2	13	98–99	4
14	70	1	14	100–101	1
15	71	0	15	102–103	1
16	72	2	16	104–105	0
			17	106–107	1
			. . . .	. . . . .	. . .
			20	112–113	1
No. of individuals . . .		20	No. of individuals . . .		44
Mean . . . . = 65·900. Standard deviation . . = 3·815. Coefficient of variation = 5·789.			Mean . . . . = 89·454. Standard deviation . . = 8·572. Coefficient of variation = 9·583.		

* See Sir WILLIAM TURNER'S memoir, *op. cit.*

TABLE XXII.

Sex.	Six men.			
Index.	$\frac{\text{Breadth to margin}}{\text{Length}}$.	$\frac{\text{Breadth to centre}}{\text{Length}}$.	$\frac{\text{Breadth to margin}}{\text{Infraspinous length}}$.	$\frac{\text{Breadth to centre}}{\text{Infraspinous length}}$.
Mean of indices . . . . Index of mean-individual .	65·97 65·96	65·60 65·50	90·47 90·29	89·89 89·66
The absolute lengths from which the index of mean-individual was calculated	$\frac{103·17}{156·40}$	$\frac{102·45}{156·40}$	$\frac{103·17}{114·26}$	$\frac{102·45}{114·26}$
Sex.	Nine women.			
Index.	$\frac{\text{Breadth to margin}}{\text{Length}}$.	$\frac{\text{Breadth to centre}}{\text{Length}}$.	$\frac{\text{Breadth to margin}}{\text{Infraspinous length}}$.	$\frac{\text{Breadth to centre}}{\text{Infraspinous length}}$.
Mean of indices . . . . Index of mean-individual .	68·00 67·85	67·84 67·67	91·69 91·12	91·44 90·87
The absolute lengths from which the index of mean-individual was calculated	$\frac{93·23}{137·40}$	$\frac{92·97}{137·40}$	$\frac{93·23}{102·31}$	$\frac{92·97}{102·31}$

TABLE XXIII.

Correlation between infraspinous length and breadth of scapula (44 scapulæ).									
Dimension.	Mean.	σ.	v.	Dimension.	Mean.	σ.	v.	r.	Probable error of r.
Infraspinous length	109·818	9·933	9·045	Breadth	98·045	7·211	7·354	0·329	0·086

SUMMARY.

Some of the more important conclusions which we have arrived at may be briefly recapitulated in the following paragraphs :—

(1.) We have seen that the variability of the long bones is roughly proportional to their absolute length.

(2.) With respect to the long bones, I have been able to detect no appreciable difference between the variabilities of the two sides of the body.

(3.) The curves which the measurements of long bones yield would appear to be generally those of limited range.

(4.) The femora of the New Race were markedly pilastric. Some few were platymeric, but these mostly had an exceptionally low pilastric index.

(5.) The length of the neck + head of the femur in proportion to the total length of the bone is longer in man than in woman, but the angle of the neck with the shaft would appear to be somewhat greater, or at least not less, in the female than in the male.

(6.) It is suggested that the angle of torsion will be found to be a race character.

(7.) The oblique length of the femur, relative to the maximum length, is shorter in woman than in man. This is due to the greater width of the pelvis, and possibly there is a fairly strong correlation between the breadth of the pelvis and the angle which the condyles make with the horizontal plane when the bone is held upright in the maximum position.

(8.) The tibiæ of the New Race exhibited platycnemia to a marked degree, but it was found less frequently in the female than in the male. There were distinct indications of a correlation between the platycnemia of the tibia and the condition of the "pilastre" of the femur.

(9.) The humeri exhibited an intercondylar foramen with remarkable frequency. Perforation occurred more often in the female than in the male, and on the left side than on the right. I am inclined to agree with Dr. TOPINARD's suggestion that the perforation in man is incidental.

(10.) The ulna was generally incurved to a greater or less degree.

(11.) The femur + tibia is slightly longer on the left side than on the right, but the right humerus + radius is very distinctly longer than the left, while, perhaps, the left clavicle and the left scapula with regard to its breadth are somewhat greater than the right. The asymmetry would appear to be more marked in woman than in man.

(12.) The New Race had an intermembral index lying between the indices assigned to Europeans and Negroes. This race was "brachyknemic" and distinctly "mesatikerkic." The radio-crural and humero-crural indices very remarkably approached the values given for Negroes by M. PAUL BROCA.

(13.) The *absolute correlations* of the bones differ very markedly from the *index correlations*. The latter in every case are smaller than the former. The "spurious correlations" are always approximately equal to 0·5. There are clear indications of a closer correlation between serially homologous bones than between non-homologous bones.

(14.) The sacrum was remarkable for the great curvature which many of the bones exhibited. This was more conspicuously shown in the male sacra, and consequently

the "length" measurement was much reduced. As measured by the ordinary sacral index, the male sacrum was broader in proportion to its "length" than the female sacrum. The New Race were as strongly platyhieric as modern Europeans.

(15.) The scapular index is higher in the female than in the male. The scapulo-spinal angle would appear to be somewhat low.

Both the scapular and the infraspinous indices closely resemble those of Europeans.

Here, then, in the New Race we have a hardy and vigorous people, as shown by the pronounced pilastre of the femur and the platycnemia of the tibia. Just as is observed in so many races, in some characters the New Race was advanced or modern; in others it was inferior or primitive. On the whole, the proportions of the limb-bones to one another may be said to have approached those of the Negro, while the sacral and scapular indices were almost identical with those of Europeans.

THE TABLES OF THE LENGTH-MEASUREMENTS OF THE BONES.

The following tables include all the length-measurements made on the bones. They constitute, I believe, by far the largest series ever made on a single race.

The publication of this raw material may appear unnecessary, but when it is remembered that perhaps in the future some of the preceding analysis may be shown to be insufficient, then the great value of such material will be evident. Besides, the skulls have not as yet been exhaustively dealt with, and the vertebral columns (other than the sacra) and certain other parts of the skeletons still remain to be studied. Now, many very important correlations could be instituted when all the material has been thoroughly worked through, and some of these would be impossible without these tables.

In the preparation of the tables it was necessary to re-sort all the measurements into the respective skeletons, and the whole series has been very carefully revised. In a few cases I became doubtful as to whether a bone really belonged to the assigned skeleton; such are indicated by a query placed over the figures. On the other hand, a few additional bones had been overlooked; these have since been measured, and it has thus been possible to construct several more undoubted skeletons. When a second skeleton was found in a grave it is indicated by an x placed after the number.

These tables, then, represent a revision of the series from which the foregoing results have been calculated. The alterations are exceedingly few and quite inappreciable with respect to the values of the constants which have been determined. A few more skeletons have been added, and so the series is slightly more complete; also the right of several bones to the place assigned them has been questioned, and a few errors in transcription have been corrected. These errors were not of a serious nature: in three or four cases the "side" of the bone had been accidentally reversed, while in copying the figures only three mistakes were detected, and the greatest of these made a difference of 0·7 millim. in the measurement.

The graves from which the skeletons were taken were divided into four groups (the "General Graves," the "Q Graves," the "B Graves," and the "T Graves"), since they were more thickly scattered over certain four localities than over the intervening area.

The tables will mostly explain themselves. The "side" of the bones, which have their measurements placed along a horizontal line, is indicated by an R (right) or L (left) in the third column. When both "sides" occur in the same line, "R.L." is put in this column, and the "side" of each measure is shown by a little *r* or *l* placed before the figures.

At the end of each series there is placed a list of the bones which possessed the same number, but which, for certain reasons, could not be sorted into skeletons. Here the number found on the bones is placed first, and then the bones themselves are indicated by letters: F = femur; T = tibia; Fib = fibula; H = humerus; R = radius; U = ulna; Cl = clavicle; Sc = sacrum.

GENERAL GRAVES.—*Skeletons.*

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
1	?	R.	..	..	..	..	..	..	..	298·5	297·0	..	..	.	..	..	..	..	..	..	..
2	♀	R.L.	..	..	..	l 349·0	l 342·3	l 328·9	..	r 289·8	r 287·0	r 233·5	r 220·0	..	..	..	..	..	..	..	..
7	♀	R.L.	..	..	..	..	..	l 325·6	..	l 292·6	l 291·8	l 229·0	l 216·0	..	..	r 132·2	..	..	..	..	..
10	♀	L.	..	..	..	354·0	342·2	329·0	..	..	..	..	..	..	..	..	..	..	..	..	..
15	♀	R.	..	..	..	363·3	356·0	342·0	..	..	..	229·0	219·0	248·0	244·0	142·6	93·2	114·0	132·0	95·2	89·8
		L.	..	..	..	366·3	358·2	344·9	..	300·4	293·3	228·6	219·0	..	..	143·8	..	..	..	..	..
15E	?	L.	..	..	..	401·2	390·6	376·3	..	..	..	..	..	..	..	..	..	..	..	..	..
16	♂	R.	437·9	437·0	..	378·2	367·9	353·3	..	310·2	308·0	252·0	237·0	273·0	268·3	..	96·4	117·3	153·4	103·0	114·8
		L.	438·0	437·6	..	..	..	..	..	307·3	306·2	250·2	235·0	273·0	268·0	152·7	..	..	156·0	104·3	114·0
18	?	R.	..	..	..	..	..	..	..	..	..	258·8	247·2	277·5	275·3	..	..	..	..	..	..
20	?	L.	..	..	..	..	..	..	..	300·9	294·8	..	..	..	..	..	..	..	..	..	..
21	♂	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	88·0	105·4	..	..	..
22	♂	R.	..	..	..	..	..	..	389·0	335·0	325·4	262·0	248·3	287·0	282·8	159·7	..	..	..	..	..
		L.	..	..	..	..	..	..	..	328·2	322·8	..	247·0	284·8	280·8	166·2	..	..	..	..	..
25	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	139·3	..	..	..	..	..
26	♂	R.	444·3	439 2	..	380·5	372·3	359·5	..	..	..	..	..	263·0	255·0	..	..	..	..	..	..
		L.	442·0	437·0	..	379·2	370·9	358·2	368·0	317·1	315·8	241·2	226·0	259·5	254·1	..	..	..	..	..	..
27	?	R.L.	..	..	..	..	..	..	..	l 308·8	l 306·8	..	..	..	r 263·0	..	98·0	109·3	..	..	..
28	?	R.	..	..	..	..	..	..	..	..	..	236·4	224·7	261·3	256·0	137·8	87·0	109·8	..	..	..
		L.	..	..	..	..	..	..	..	293·4	292·2	230·0	218·0	..	250·0	..	..	..	..	..	..
30	♀	R.	403·8	400·4	..	..	..	..	..	294·5	294·5	241·2	228·3	259·0	255·0	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	289·4	289·3	236·8	223·5	254·2	250·8	140·6	..	..	..	..	..
31	?	R.L.	l 421·3	l 416·5	..	..	..	..	..	..	..	..	..	..	..	r 136·2	..	..	..	..	..
36	♀	R.	..	..	..	351·0	342·2	330·6	..	308·0	304·9	..	..	264·0	258·3	139·8	..	..	..	..	..
		L.	435·2	431·0	68·5	355·0	345·5	335·0	..	304·0	298·3	245·0	233·0	..	..	..	..	..	..	..	..
37	♂	R.	..	..	..	..	..	..	..	347·0	338·0	271·3	255·3	293·8	287·3	..	109·3	119·9	..	..	..
		L.	..	..	..	420·5	410·5	394·0	..	..	..	..	..	293·7	288·5	..	..	..	..	..	..
38	?	R.	445·8	441·2	..	..	..	..	..	325·4	316·8	..	..	..	..	..	..	..	..	..	..
		L.	445·3	440·1	..	..	..	..	..	317·2	..	..	..	..	..	..	..	..	..	..	..
40	?	R.L.	..	..	..	..	..	..	..	..	..	l 234·2	l 222·2	..	..	r 141·5	..	..	..	..	..
40(2)	?	R.	..	..	..	..	..	..	..	308·0	307·0	..	..	..	..	..	..	..	..	..	..
41	?	R.	..	..	..	377·2	366·9	352·9	..	..	..	..	..	..	..	..	..	..	..	..	..
42	?	L.	..	..	..	..	..	..	..	327·0	321·8	..	..	..	..	..	..	..	..	..	..
43	♀	R.	..	..	..	394·7	383·3	366·9	..	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maxi-mum.	Femur. Ob-lique.	Femur. Neck.	Tibia. Maxi-mum.	Tibia. Ex-cluding spine.	Tibia. Centre to centre.	Fibula. Maxi-mum.	Humerus. Maxi-mum.	Humerus. Ob-lique.	Radius. Maxi-mum.	Radius. Centre to centre.	Ulna. Maxi-mum.	Ulna. Ex-cluding styloid.	Clavicle. Maxi-mum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
43	♀	L.	467·6	463·5	..	392·0	380·0	365·0	..	..	..	..	..	..	..	..	..	..	..	..	..
49	♀	R.	432·3	427·0	..	352·3	343·0	329·8	..	..	..	..	..	..	..	..	83·1	119·0	..	..	..
		L.	..	..	..	352·8	343·8	331·3	..	..	..	238·3	225·3	..	..	..	..	..	..	..	..
50	♂	R.	441·0	435·0	..	366·0	358·0	344·6	..	319·2	..	..	..	..	..	142·4	94·8	116·4	..	..	..
		L.	443·2	438·6	..	370·1	362·4	348·0	..	314·8	313·0	249·5	235·0	..	..	..	..	..	..	..	..
51	?	R.	418·0	417·4	..	..	..	..	..	305·3	303·1	244·5	230·1	..	..	147·2	..	..	..	..	..
		L.	..	.	..	358·8	350·9	336·3	..	300·3	..	..	..	..	..	143·2	..	..	..	..	..
52	♂	R.L.	..	..	..	..	..	*l* 353·2	..	*r* 313·2	*r* 311·8	*r* 244·2	*r* 231·4	..	..	..	..	..	..	..	..
53	♂	R.	458·5	457·0	..	384·2	374·8	359·2	371·0	320·5	312·3	252·0	239·0	274·8	269·5	156·3	..	..	156·1	107·8	107·0
		L.	..	..	..	388·4	378·0	363·3	374·0	322·3	315·0	252·0	237·8	274·0	269·0	154·0	..	..	..	108·5	106·1
54	♀	R.	..	..	..	..	..	..	..	..	..	..	..	273·0	267·0	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	269·2	263·0	..	..	..	..	..	..
59	?	R.	..	..	..	360·3	352·7	339·6	..	..	..	..	..	..	..	..	105·0	106·0	..	..	..
		L.	..	..	..	..	..	343·4	..	..	..	..	..	..	..	..	..	..	..	..	..
63	♀	R.L.	..	..	..	..	..	..	..	..	..	*l* 244·0	*l* 230·0	..	*l* 255·0	*r* 169·2	..	..	..	..	..
64	♀	R.L.	..	..	..	..	..	..	..	*l* 293·0	..	..	..	..	..	*l* 139·0	..	..	*r* 135·3	*r* 92·5	*r* 93·2
71	?	R.	..	..	..	..	..	..	..	..	..	..	..	263·2	261·0	..	..	..	..	..	..
71B	?	R.	435·5	432·1	68·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	?	L.	..	..	..	350·0	342·7	330·3	..	..	..	..	..	..	..	..	..	..	..	..	..
80	?	L.	..	..	..	..	..	..	..	261·2	259·8	..	..	..	..	132·8	..	..	..	..	..
81	♀	R.	409·7	404·1	64·6	..	..	..	..	286·8	283·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	333·2	324·0	312·2	..	283·2	..	..	..	..	..	..	..	..	..	..	..
85	?	L.	..	..	..	..	..	..	..	..	..	..	210·3	..	..	..	..	..	..	..	..
86	♀	R.	..	..	..	..	..	..	..	..	..	226·2	214·3	..	..	136·5	..	..	..	..	..
		L.	..	..	..	..	..	..	..	291·2	288·0	212·0	..	..	..	..	..	..	..	..	..
87	?	R.	..	..	..	..	..	..	..	306·3	301·3	..	..	..	..	..	..	..	..	..	..
88	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	142·5	..	..	..	..	..
94	♀	R.	430·2	426·8	..	358·7	352·3	349·2	..	294·5	293·0	..	..	..	..	132·2	..	..	..	..	..
		L.	..	..	..	357·9	350·2	338·5	..	289·0	..	..	..	245·2	241·8	..	..	..	..	..	..
108*a*	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	134·0	..	..	..	..	..
109	♀	R.	..	..	..	368·3	357·2	341·8	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	371·8	362·0	346 2	..	..	..	..	..	..	..	..	..	..	..	..	..
113A	♂	R.	..	..	..	374·0	363·5	348·9	..	..	..	253·2	238·0	266·3	262·2	..	..	..	..	..	..
		L.	..	..	..	..	..	..	351·0	317·0	314·4	..	240·0	265·0	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre.	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
113B	?	R.	..	..	..	..	..	..	..	..	..	218·0	207·3	..	..	..	81·5	118·8	..	..	..
114	♀	R.	..	..	..	394·5	384·6	372·6	..	..	..	..	..	..	..	..	110·0	103·9	..	..	..
		L.	..	..	..	394·2	384·3	372·7	..	..	..	252·2	238·0	271·0	268·0	..	..	..	..	..	..
115	♀	R.	..	..	..	339·2	332·2	318·4	..	..	..	..	..	..	..	..	101·2	108·2	..	..	..
		L.	401·0	399·0	..	..	..	322·9	..	..	..	..	..	241·2	237·0	..	..	..	..	..	..
116	?	R.	441·3	437·5	66·6	..	..	..	..	..	..	..	..	267·0	260·6	?137·8	..	..	..	..	..
119*a*	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	112·4	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	..	..	113·0	..	..	..	..	..
121	♀	R.	..	..	..	367·2	359·0	344·6	..	309·6	304·2	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	369·8	361·5	347·5	..	..	..	..	..	259·6	256·3	..	..	..	..	..	..
124	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	136·9	..	..	..	..	..
128	?	L.	..	..	..	..	..	372·0	..	..	..	..	..	..	..	..	..	..	..	..	..
143	?	R.	..	..	..	377·0	367·8	354·0	..	..	..	..	..	..	..	..	..	..	..	..	..
148	♀	R.	..	..	..	365·0	356·8	343·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	346·0	..	..	..	..	..	..	..	..	..	..	..	..	..
176B	?	L.	440·3	437·0	63·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
182	?	L.	463·4	460·8	71·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
183	?	R.	..	..	..	..	..	392·5	..	..	..	..	..	..	..	..	..	..	..	..	..
197	♂	R.L.	*r* 443·2	*r* 442·8	*r* 69·8	..	..	*l* 376·8	..	..	..	..	..	..	..	..	..	..	..	..	..
204	?	R.	435·6	434·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	444·3	442·2	67·0	..	..	372·0	..	..	..	..	..	..	..	..	..	..	..	..	..
210	?	R.	..	..	..	..	..	316·0	..	..	..	..	..	..	..	..	..	..	..	..	..
214	?	R.	..	..	..	390·2	381·0	368·8	..	..	..	..	..	..	..	..	..	..	..	..	..
215	?	L.	..	..	..	411·0	401·2	387·0	..	..	..	..	..	..	..	..	..	..	..	..	..
221	?	R.	..	..	..	..	..	..	..	301·3	297·5	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	296·3	291·5	..	..	..	..	..	..	..	..	..	..
225	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	135·3	..	..	..	..	..
226	?	R.	407·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
232	♂	R.	444·5	440·2	..	379·0	370·0	354·8	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	381·6	372·3	357·3	..	..	..	..	..	..	..	..	..	..	..	..	..
236	?	R.	431·3	428·0	67·0	..	..	..	..	306·0	304·3	249·8	238·0	..	..	..	..	..	..	..	..
		L.	..	..	..	369·5	362·3	349·0	..	308·2	..	..	..	..	..	..	..	..	..	..	..
240	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	147·8	..	..	..	..	..
251	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	139·0	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
255	♂	R.	379·0	373·3	..	407·0	395·4	382·4	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	377·0	374·0	..	..	..	..	395·4	..	..	..	..	..	..	..	..	..	..	..	..
256	?	R.L.	l 433·4	l 430·8	..	r 375·0	r 366·0	r 351·0	..	..	..	l 242·2	l 229·8	..	..	l 147·3	..	..	..	..	..
260	?	R.	..	..	..	..	..	..	417·0	..	..	..	..	..	..	..	..	..	..	..	..
262	?	R.L.	..	..	..	..	..	..	..	..	..	l 256·0	l 243·5	..	..	156·2	..	..	..	..	..
264	?	R.	..	..	..	..	..	348·0	..	..	..	..	..	..	..	..	..	..	..	..	..
266	?	L.	..	..	..	..	..	377·3	..	..	..	..	..	..	..	..	..	..	..	..	..
269	?	R.	444·0	438·0	..	374·0	366·0	352·9	..	..	..	..	..	..	..	140·0	..	..	..	..	..
		L.	..	..	..	373·8	365·2	353·0	363·2	..	..	..	..	..	..	140·8	..	..	..	..	..
276	?	L.	..	..	..	..	..	..	..	312·4	309·2	..	..	..	..	..	..	..	..	..	..
277	?	L.	..	..	..	414·0	400·9	385·0	..	..	..	..	..	..	..	..	..	..	..	..	..
279	?	R.L.	..	..	..	..	..	..	..	..	..	..	..	r 242·0	r 237·8	l 144·3	..	..	..	..	..
282	♀	R.	428·8	423·0	65·5	362·0	355·0	341·0	..	..	..	..	..	..	..	..	..	..	..	..	..
283A	?	R.	419·5	406·2	60·6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
283B	?	R.	492·3	486·2	..	415·3	404·0	391·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	487·5	486·3	..	..	..	..	..	345·3	330·0	..	..	..	..	..	..	..	..	..	..
283C	?	R.	..	..	..	413·8	403·7	387·5	..	343·8	332·5	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	412·0	401·3	386·3	..	..	..	..	..	..	..	..	..	..	..	..	..
284	♂	R.	452·5	..	..	377·1	366·3	351·2	..	..	..	..	..	291 5	282·4	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	322·1	318·0	..	..	286·5	280·5	..	..	..	..	..	..
294	♂	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	144·8	..	..	..	..	..
296	♀	—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112·0	118·2	..	..	..
299	?	L.	..	..	..	..	..	..	..	..	..	263·0	249·3	..	..	..	..	..	..	..	..
300	?	L.	..	..	..	..	..	..	..	330·2	329·8	..	..	..	..	..	..	..	..	..	..
303	?	L.	..	..	..	..	..	..	..	333·0	..	..	..	..	..	..	..	..	..	..	..
305	♀	R.	440·1	436·3	72·1	372·0	362·1	349·0	..	..	..	238·0	223·2	..	..	153·2	102·1	110·5	..	..	..
		L.	443·3	441·2	..	370·0	360·2	348·0	..	..	..	..	..	..	..	..	..	..	..	..	..
308	♂	R.	..	..	..	..	..	..	..	..	..	..	276·0	..	..	..	..	..	..	..	..
309	♀	R.L.	r 433·0	r 430·0	r 68·0	..	..	..	r 327·0	..	..	l 216·3	l 204·0	l 238·0	l 234·0	r 132·3	..	..	..	..	..
314	?	R.L.	..	..	..	r 334·5	r 328·0	r 315·0	..	..	..	..	..	l 242·4	l 236·7	..	..	..	..	..	..
315	♂	R.	..	..	..	..	..	..	..	318·0	315·0	..	..	..	..	136·5	..	..	..	..	..
		L.	415·4	412·8	..	..	..	323·0	..	316·8	311·8	..	..	..	257·0	143·2	..	..	..	..	..
316A	?	L.	428·5	..	..	..	..	..	362·9	..	..	..	..	..	..	..	102·5	108·9	..	..	..
316B	?	L.	..	..	..	346·0	338·2	327·0	..	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
318	♂	R.	..	..	..	377·5	368·4	355·5	364·7	329·0	327·0	259·2	244·8	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	323·0	321·0	..	..	..	..	151·2	..	..	..	..	..
324	?	L.	..	..	..	..	..	336·2	..	..	..	..	..	..	..	..	..	..	..	..	..
330	♀	R.	408·2	406·4	..	348·0	341·0	328·6	..	292·3	291·8	..	..	..	..	..	..	..	..	..	..
		L.	409·0	406·0	..	351·0	343·8	332·0	..	..	..	..	..	..	..	..	..	..	..	..	..
331	♂	R.	..	..	..	395·0	386·6	373·9	381·7	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	398·0	389·8	375·8	..	..	..	..	..	..	..	..	..	..	..	..	..
341	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	139·8	..	..	..	..	..
342	♀	L.	..	..	..	..	..	..	..	298·3	297·0	..	..	..	..	..	..	..	..	..	..
343	♂	R.L.	r 456·2	..	..	..	..	..	..	r 317·1	r 314·8	l 240·2	l 226·0	..	..	..	..	..	..	r 92·5	r 103·8
348	♀	R.	413·0	410·2	64·1	..	.	335·5	..	..	..	..	..	..	..	..	87·0	106·5	..	..	..
		L.	412·3	410·0	..	353·2	345·0	332·3	..	..	..	..	..	..	..	..	..	..	..	..	..
358	♂	R.	451·8	448·2	..	386·2	378·0	364·0	374·5	312·3	308·8	..	..	266·0	262·3	..	87·2	106·0	144·2	93·2	104·0
		L.	448·8	447·1	70·0	386·2	377·8	366·3	..	305·8	302·6	..	..	265·0	262·3	..	..	..	..	..	..
363	♂	R.	..	..	..	..	..	..	..	333·7	331·6	264·5	249·2	287·8	282·0	167·5	98·2	109·0	..	..	..
		L.	462·5	458·0	..	386·0	373·6	359·0	..	..	..	266·0	249·2	..	..	..	..	..	..	..	..
370 ?	?	L.	..	..	..	..	..	..	..	..	..	257·4	243·1	..	..	..	..	..	..	..	..
377	♀	R.	404·0	401·9	65·2	..	..	..	369·8	..	..	..	..	..	..	..	..	..	..	..	..
381	♂	R.	459·8	458·9	..	396·0	386·0	371·3	..	..	..	..	..	..	..	..	..	..	..	..	..
382	♂	R.	465·3	461·0	..	382·0	371·4	356·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	464·0	461·3	74·7	384·0	374·8	359·0	..	..	..	..	..	..	..	147·3	..	..	..	..	..
383	♂	R.L.	l 450·0	l 455·0	..	..	..	l 375·2	r 382·8	l 321·6	l 320·1	..	..	..	..	..	..	..	..	..	..
385	♂	R.	477·2	474·3	..	..	..	..	..	..	..	..	..	280·8	277·0	..	..	..	..	..	..
386	?	R.	..	..	..	392·0	382·0	368·0	..	..	..	..	..	..	..	..	..	..	..	..	..
388	?	R.L.	r 420·0	r 413·8	r 64·0	l 360·0	l 350·8	l 338·4	..	..	..	..	..	..	..	..	..	..	..	..	..
391	♀	R.	415·2	..	..	..	345·2	330·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	416·1	414·0	67·1	358·5	350·0	354·6	..	..	..	..	..	..	..	..	..	..	..	..	..
401	?	R.	..	..	..	..	..	..	..	..	..	265·4	252·3	..	..	169·2	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	245·0	278·3	275·5	..	..	..	..	..	..
402	♀	R.	425·5	424·0	74·0	347·0	338·8	327·0	..	291·4	289·0	..	..	250·5	246·8	..	103·0	106·7	..	..	..
		L.	426·5	425·4	..	349·8	339·8	326·5	..	289·8	285·4	228·5	216·2	248·1	244·8	..	..	..	..	..	..
403 ?	?	R.	..	..	..	..	..	..	..	300·0	297·0	..	..	..	..	..	..	..	..	..	..
412	?	R.	..	..	..	..	..	..	377·0	..	..	286·5	..	..	..	..	..	..	..	..	..
417	?	R.L.	l 455·0	l 451·2	..	l 377·3	l 370·0	l 356·0	r 344·3	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
422	?	L.	430·5	426·5	67·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
425	♂	R.	..	..	..	354·0	345·0	329·5	343·0	320·0	317·0	..	..	..	..	142·3	..	..	..	..	..
		L.	..	..	..	354·3	345·2	331·0	346·5	314·3	310·2	..	..	..	..	..	..	..	..	..	..
428	?	R.	..	..	..	..	338·0	324·0	..	..	..	..	..	..	..	124·9	..	..	..	..	..
		L.	..	..	..	347·5	340·6	326·8	..	..	..	..	..	..	..	..	..	..	..	..	..
431 ?	?	R.	..	..	..	388·5	379·0	365·0	..	..	..	..	..	..	..	..	..	..	..	..	..
434	♀	R.L.	r 436·2	r 434·0	..	l 382·8	..	..	..	l 306·3	l 303·0	..	..	l 262·3	l 255·8	..	108 8	110·2	..	..	..
437	♂	R.	471·0	464·0	..	410·8	401·0	384·0	391·8	338·1	332·4	268·3	254·5	..	..	..	106·5	114·0	..	..	..
		L.	476·0	470·4	..	410·3	401·2	385·1	392·4	335·5	333·0	..	..	..	..	..	..	..	..	..	..
441	♂	R.	474·8	..	..	..	..	..	..	340·1	335·3	..	..	..	..	..	..	..	..	..	..
442	♂	R.L.	r 416·3	r 413·2	..	l 353·2	l 342·7	l 329·8	..	?r 288·0	?r 284·1	..	..	r 260·3	r 256·3	r 145·8	..	..	..	..	..
470	♀	R.	431·2	427·5	..	364·0	355·0	339·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	432·0	429·3	..	..	..	337·2	..	..	..	..	..	..	..	..	..	..	..	..	..
473	?	R.L.	r 441·0	..	..	..	..	..	..	..	..	..	..	l 267·2	l 262·4	..	..	..	..	..	..
480	?	R.	..	..	..	..	..	..	339·0	..	..	..	..	..	..	..	..	..	..	..	..
502	♀	R.L.	..	..	..	..	..	..	..	r 309·7	r 305·0	l 243·1	l 230·2	..	..	..	..	..	..	..	..
507	♀	R.	..	..	..	..	..	334·8	..	301·3	300·9 (—)*	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	354·0	345·8	333·0	..	..	..	..	..	..	..	..	..	..	..	..	..
510	?	R.	..	..	..	..	..	..	..	..	..	229·0	217·0	246·7	242·0	..	..	..	..	..	..
511	?	R.	439·2	430·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
512	?	L.	390·0	387·0	..	331·2	322·4	308·4	..	..	..	..	..	..	..	..	..	..	..	..	..
519b	♀	R.	468·8	466·9	72·3	388·0	380·0	365·9	375·0	..	..	..	..	..	..	..	..	..	..	..	..
		L.	463·7	462·5	..	388·3	379·4	366·0	372·8	320·2	317·3	259·7	247·0	278·2	273·5	..	..	..	..	..	..
522	?	L.	..	..	..	..	..	..	362·3	..	..	..	..	..	..	..	..	..	..	..	..
523	♀	L.	..	..	..	..	..	..	371·0	..	..	..	..	..	..	..	..	..	..	..	..
525	?	R.	..	..	..	..	..	..	..	311·2	307·2	..	..	..	..	..	..	..	..	..	..
526	♂	R.	436·4	433·8	..	..	..	336·8	..	323·0	320·1	242·0	238·4	..	..	144·2	..	..	..	98·9	102·5
		L.	441·2	437·2	71·6	361·5	351·7	338·3	345·0	319·5	317·4	245·0	232·0	263·2	258·4	..	..	..	..	..	..
527	♀	R.	..	..	..	373·0	365·2	350·3	..	..	..	..	..	..	..	..	94·7	118·0	..	..	..
		L.	433·7	427·2	..	374·8	364·8	351·5	..	..	..	..	..	..	..	..	..	..	..	..	..
529	?	R.L.	..	..	..	..	..	..	..	..	..	..	r 218·5	..	..	l 133·0	..	..	..	..	..
530	♂	R.	425·0	419·8	69·0	369·0	360·0	345·5	..	312·3	306·5	..	..	..	..	..	..	..	..	97·0	115·0
		L.	426·2	423·3	70·0	370·3	361·4	348·0	..	309 0	307·0	252·3	237·7	277·3	273·0	..	..	..	..	98 9	113·0

* The sign (—) indicates that the bone sloped outwards instead of inwards when the trochlea and capitellum were placed on a horizontal plane.

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre.	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
531	♀	R.L.	r439·5	r434·5	r67·1	l362·6	l354·6	l343·5	..	l292·4	l289·6	..	..	..	..	l148·5	..	..	..	..	..
533	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	118·9	..	..	..	..	..
534	♂	R.L.	l421·7	..	..	l352·8	l343·7	l330·2	..	r299·8	r295·0	..	..	..	..	r143·0	..	..	..	..	..
535	♀	R.	..	..	..	..	..	..	..	..	..	236·0	224·0	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	229·3	219·0	..	..	..	..	..	..	..	..
537	♀	R.	421·0	416·7	62·5	345·8	336·3	323·6	334·5	..	..	..	..	..	..	..	..	..	..	..	..
		L.	424·8	420·8	60·7	349·3	340·0	328·2	..	..	..	..	..	..	..	..	..	..	..	..	..
538	♀	L.	..	..	..	351·6	344·0	332·0	..	..	..	..	..	..	..	..	..	..	..	..	..
540	?	R.	..	..	..	..	346·0	332·6	..	..	..	..	..	..	..	..	..	..	..	..	..
541	♀	R.	413·2	408·8	61·1	..	..	..	..	295·0	292·8	228·3	215·6	..	..	142·0	..	..	..	..	..
		L.	409·8	408·3	..	347·6	338·0	323·0	341·0	291·5	289·5	225·6	213·0	..	247·2	..	..	..	..	..	..
542	♀	R.	455·6	450·2	74·6	367·8	360·2	347·0	..	..	..	234·4	223·0	..	251·4	133·2	..	..	..	..	..
		L.	457·8	454·0	..	368·0	360·2	347·0	..	295·8	289·7	233·2	222·3	..	..	139·0	..	..	..	..	..
544	♂	R.	458·0	457·0	..	384·0	375·3	361·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	461·5	459·0	..	..	..	..	..	323·0	317·8	..	..	..	..	..	..	..	..	..	..
546	♀	R.	416·8	410·0	..	347·2	336·8	323·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	417·8	411·4	..	344·1	335·0	322·1	335·2	..	..	..	..	..	..	..	..	..	..	..	..
548	?	R.	..	..	..	346·0	336·1	323·6	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	345·2	336·1	323·9	..	..	..	..	..	..	..	..	..	..	..	..	..
550	♀	R.	449·2	444·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	442·0	436·4	..	359·8	351·0	338·9	351·2	297·5	297·5	..	..	..	..	..	..	..	..	..	..
551	♀	R.	..	..	..	..	..	..	..	306·6	301·2	237·0	225·0	..	..	138·0	..	..	..	..	..
		L.	..	..	..	..	..	..	..	304·4	301·5	234·2	221·3	..	..	..	..	..	..	..	..
552	?	R.	..	..	..	..	..	339·7	..	..	..	..	..	..	..	..	..	..	..	..	..
553	?	L.	..	..	..	..	..	..	..	..	..	240·3	226·2	..	..	..	..	..	..	..	..
556	♀	R.	..	..	..	..	..	..	..	300·2	297·0	..	..	..	..	..	..	..	..	..	..
		L.	427·0	421·3	64·6	..	..	..	..	295·3	292·0	..	..	..	..	..	..	..	..	..	..
563	?	L.	..	..	..	..	..	350·3	..	..	..	..	..	..	..	..	..	..	..	..	..
570	♀	R.	407·7	402·8	..	353·0	344·4	331·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	412·3	407·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
575	♂	R.	464·0	..	..	411·8	402·6	387·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	271·5	257·2	297·0	289·0	..	..	..	..	..	..
576	♀	R.	401·7	396·0	63·5	334·2	325·0	312·0	..	279·5	277·2	218·0	207·0	..	..	136·0	..	..	..	..	..
		L.	400·2	395·8	..	334·3	325·5	313·3	..	274·0	..	211·2	199·8	235·8	231·3	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra spinous length.
577	♀?	R.	434·6	430·4	65·4	..	..	..	..	..	..	228·0	216·0	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	340·0	..	297·5	294·5	225·8	214·0	..	..	131·4	..	..	..	..	..
578	♀?	R.	..	..	..	..	..	332·0	..	..	..	..	..	..	..	136·0	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	..	..	143·2	..	..	..	..	..
583	♂	R.	455·0	448·3	..	373·0	362·8	349·3	..	..	..	251·8	237·8	..	..	..	..	..	..	..	..
586	♀	R.L.	r 422·8	r 418·0	r 65·8	l 354·0	l 346·0	l 333·0	..	..	..	..	..	..	..	..	..	..	..	..	..
588	♀?	R.	..	..	..	..	..	..	..	311·3	308·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	393·0	384·7	369·0	..	310·3	..	236·0	223·2	259·7	254·0	..	..	..	..	..	..
590	♀?	R.	..	..	..	412·5	401·2	386·5	..	331·2	..	256·0	244·0	..	..	..	..	..	..	..	..
593	♀	R.	..	..	..	366·0	358·0	342·0	..	..	..	234·0	220·5	..	..	..	..	..	..	..	..
		L.	..	..	..	363·2	354·3	339·0	..	295·2	291·2	..	..	..	..	..	..	..	..	..	..
594	♂	R.	457·5	454·8	70·6	389·5	379·0	364·0	378·0	335·0	333·0	..	..	283·2	276·8	..	92·8	111·4	..	..	..
		L.	459·0	451·4	69·5	394·0	384·0	369·5	..	..	..	..	..	..	..	..	..	..	..	..	..
597	♀?	L.	432·0	428·0	69·3	363·0	352·0	340·0	349·8	..	..	..	..	..	..	..	..	..	..	..	..
610	♀	R.	..	..	..	..	346·8	334·0	..	298·4	297·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	363·0	354·3	339·5	..	..	..	..	..	..	..	..	..	..	..	..	..
612	♀?	R.	..	..	..	353·0	345·0	330·5	..	..	..	..	..	..	..	..	..	..	..	..	..
617	♀	R.	..	..	..	377·2	367·0	352·0	..	321·3	318·0	257·0	244·0	..	..	..	103·3	115·2	..	..	..
		L.	..	..	..	376·8	368·4	355·4	..	..	..	..	..	..	..	..	..	..	..	..	..
618	♀	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	125·6	..	..	..	..	..
620	♂	R.L.	..	..	..	..	..	..	..	r 319·3	r 311·2	..	..	..	..	l 153·2	102·0	110·3	..	..	..
625	♀	R.	411·2	405·8	66·0	345·2	337·0	322·7	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	407·0	404·0	..	..	..	321·0	..	..	..	..	..	..	..	..	..	..	..	..	..
627	♂	R.	..	..	..	374·0	364·4	350·0	..	..	..	..	..	..	..	..	96·8	110·3	..	..	..
		L.	447·0	443·2	69·5	378·3	369·0	354·0	..	..	..	..	..	..	..	..	..	..	..	..	..
632	♀?	R.L.	..	..	..	..	..	..	..	l 302·0	l 298·0	r 241·6	r 228·8	r 263·7	r 257·0	..	..	..	..	..	..
633	♂	R.	..	..	..	414·0	404·2	388·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	481·4	477·0	78·3	411·0	400·6	386·3	..	..	..	..	..	..	..	..	..	..	..	..	..
634	♀	R.	416·4	412·0	62·2	347·2	339·0	326·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	417·6	414·2	..	349·0	340·3	329·0	..	..	..	..	..	..	..	146·0	..	..	..	..	..
635	♀	R.	423·0	419·0	66·2	358·0	349·0	335·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	424·0	421·8	..	362·0	353·0	339·0	..	..	..	..	..	..	..	..	..	..	..	..	..
636	♂	R.	433·0	429·0	..	376·0	366·7	351·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	438·2	..	..	378·0	367·2	353·1	..	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre.	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
637	♀	R.L.	r 449·5	r 447·4	..	..	..	..	..	..	..	..	..	l 254·0	l 251·3	..	103·9	105·2	..	..	..
639	?	L.	423·2	416·0	67·6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
643	♀	R.L.	..	..	..	..	..	..	..	r 304·0	r 298·2	l 252·2	l 246·4	..	..	..	..	..	..	..	..
646	♂	R.L.	l 463·0	l 462·1	l 74·5	l 393·0	l 383·3	l 368·3	..	l 324·2	l 322·0	r 265·7	r 251·0	..	..	..	..	..	..	..	..
647	♀	R.	407·3	405·5	63·8	334·0	325·2	311·6	..	289·2	287·0	..	..	..	..	..	..	..	..	..	..
		L.	408·3	..	..	..	..	..	..	..	..	..	..	..	..	137·6	..	..	..	..	..
650	?	R.L.	..	..	..	r 382·4	r 376·0	r 363·4	..	l 330·3	l 329·8	..	..	..	..	..	..	..	..	..	..
652	♀	R.	..	..	..	349·5	341·7	329·0	..	..	..	231·2	220·2	..	..	..	..	..	..	..	..
		L.	..	..	..	351·7	342·0	331·0	..	298·1	296·0	..	..	254·1	248·4	..	..	..	..	..	..
658	♀	R.	449·0	442·0	70·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	447·6	444·2	..	373·0	364·5	352·0	362·1	..	..	..	..	..	..	..	..	..	..	..	..
660	♂	R.	443·0	440·5	..	386·0	377·1	362·0	..	327·0	325·0	..	..	280·1	274·3	..	..	..	..	..	..
		L.	445·0	443·0	..	..	..	..	..	322·4	319·9	..	..	..	..	..	..	..	..	..	..
661	?	R.L.	l 406·2	l 400·2	..	..	..	..	..	..	..	..	..	..	..	r 136·3	..	..	..	..	..
662	♀	—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80·2	114·6	..	..	..
664	♀	R.	..	..	..	..	..	..	..	340·2	334·3	..	..	?263·8	?261·8	..	..	..	..	..	..
		L.	..	..	..	390·8	381·2	366·0	..	341·5	331·5	..	..	285·0	284·0	154·8	..	..	..	..	..
667	?	R.	..	..	..	360·2	351·2	337·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	427·4	424·0	67·1	360·3	351·2	338·2	343·3	291·7	290·1	..	..	..	..	..	..	..	..	..	..
668	♂	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	143·1	..	..	..	..	..
674	?	L.	..	..	..	..	..	..	..	288·2	287·8	..	..	..	..	..	..	..	..	..	..
681	?	R.	..	..	..	..	..	..	..	281·0	276·5	..	..	..	..	137·5	..	..	..	..	..
683	♂?	R.L.	..	..	..	..	..	..	..	..	..	r 286·0	r 270·0	..	r 303·2	l 150·7	..	..	..	..	..
687	?	R.	..	..	..	401·0	392·0	378·2	..	..	..	..	..	..	..	..	..	..	..	..	..
690	♀	R.	443·0	439·0	..	364·8	356·0	343·0	351·0	..	..	..	..	..	..	..	..	..	..	..	..
691	?	R.	..	..	..	368·0	357·6	339·8	352·8	..	..	..	..	..	..	..	..	..	..	..	..
692	♀	R.	..	..	..	346·2	338·0	324·4	..	..	..	..	..	..	..	..	84·0	111·0	..	..	..
		L.	409·8	408·0	..	345·0	337·0	324·3	..	..	..	..	..	..	..	..	..	..	..	..	..
693	♀	R.	..	..	..	..	..	314·8	..	296·4	292·0	..	..	..	237·0	..	..	..	..	..	..
		L.	..	..	..	337·3	326·7	315·0	..	..	..	218·0	204·9	..	232·3	..	..	..	..	..	..
696	♀	R.	449·3	445·0	..	..	..	..	374·3	312·0	307·0	245·0	233·5	265·2	261·0	145·8	..	..	..	..	..
		L.	453·3	451·0	..	376·5	364·8	352·3	..	306·2	299·3	240·4	229·8	..	..	..	..	..	..	..	..
697	♂	R.	434·0	433·5	..	371·8	362·2	349·2	..	319·0	310·4	242·3	230·4	..	..	140·9	..	..	..	..	..
		L.	434·0	432·0	72·7	372·0	362·8	349·0	..	..	..	237·3	223·8	..	..	..	..	..	..	..	..

General Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
698	?	L.	..	..	..	..	..	..	337·3	..	..	..	..	..	..	..	..	..	..	..	..
701	♂	R.	446·5	440·6	..	373·2	363·2	349·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	445·6	443·0	75·3	373·3	363·8	348·4	..	..	..	247·7	232·9	265·3	262·4	..	..	..	..	..	..
706	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	153·6	..	..	..	..	..
707	♂	R.	488·6	484·8	..	406·5	397·3	382·5	..	..	..	261·1	247·4	278·3	274·2	..	..	..	..	..	..
		L.	..	..	..	408·2	399·0	386·0	395·3	..	..	..	..	..	..	..	..	..	..	..	..
710	♀	R.	..	..	..	379·0	369·4	354·5	361·2	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	376·8	367·0	353·0	357·0	..	..	238·0	226·2	..	..	..	..	..	..	..	..
711	♀	R.	..	..	..	..	..	..	..	292·0	282·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	285·2	..	..	..	..	..	..	..	..	..	..	..
712	♀	R.	442·0	434·5	..	383·5	374·6	362·4	369·4	304·5	300·8	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	386·3	379·4	366·9	..	299·8	297·5	..	..	..	..	..	..	..	..	..	..
716	♀	R.	388·0	386·0	62·9	321·0	312·3	297·3	309·3	278·0	272·5	..	..	..	..	130·0	..	..	..	..	..
		L.	385·3	383·5	66·9	..	..	..	..	270·3	268·0	..	..	233·2	228·0	137·0	..	..	..	..	..
717	♀	R.	413·2	411·1	67·1	339·3	332·0	317·2	..	287·0	286·0	..	217·0	252·9	248·7	130·4	91·3	104·0	..	..	..
		L.	418·3	414·0	65·9	..	..	..	..	283·0	282·1	230·0	216·0	252·0	246·0	134·7	..	..	..	..	..
718	♀	R.L.	*l* 435·3	*l* 433·2	..	..	..	..	*r* 353·0	*l* 311·3	*l* 308·5	*l* 245·0	*l* 230·0	..	*r* 262·8	*r* 142·0	86·4	106·8	..	..	..
722	?	R.	437·5	436·8	..	..	..	..	..	315·0	313·0	..	..	..	..	151·3	..	..	..	..	..
		L.	..	..	..	373·0	363·0	348·1	..	313·0	309·3	..	..	..	..	..	..	..	..	..	..
724	♀	R.	442·0	439·0	..	358·0	349·0	335·3	..	..	..	239·0	226·4	..	..	..	..	..	..	..	..
		L.	449·0	439·0	66·0	363·8	355·2	341·6	356·4	..	..	..	..	..	..	..	..	..	..	..	..
727	?	R.	427·0	423·0	65·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
728	♀	R.	431·3	417·5	..	364·5	356·5	341·8	..	306·2	302·0	236·8	224·5	..	..	146·5	..	..	..	..	..
		L.	429·0	422·3	66·5	..	..	..	..	301·0	298·2	..	..	..	..	..	..	..	..	..	..
729	?	R.	475·0	472·0	..	374·2	363·7	345·5	..	329·0	321·2	255·5	241·3	..	..	153·2	..	..	..	..	..
		L.	475·4	470·4	..	372·0	361·6	345·0	356·0	327·0	320·6	255·0	242·0	275·5	272·3	161·3	..	..	..	..	..
730	♀	R.L.	*l* 445·4	*l* 443·0	*l* 69·7	*r* 383·0	*r* 374·8	*r* 360·2	..	*r* 318·3	*r* 316·0	*l* 244·2	*l* 230·6	..	..	*r* 141·6	105·3	117·4	..	..	..
731	♀	R.	..	..	..	391·0	380·4	367·0	378·0	..	..	..	..	..	..	..	105·2	119·1	..	..	..
		L.	..	..	..	..	..	..	377·0	308·4	306·0	..	..	279·4	275·1	..	..	..	..	..	..
733	♀	R.L.	..	..	..	*l* 390·2	*l* 381·0	*l* 367·0	..	..	..	..	*r* 241·3	..	..	..	..	..	..	..	..
736	?	R.L.	..	..	..	*r* 327·5	*r* 317·6	*r* 304·4	..	..	..	*l* 214·2	*l* 203·1	..	..	..	..	..	..	..	..
740	♀	R.	..	..	..	..	..	..	..	298·2	297·0	237·4	225·3	259·2	254·3	137·4	..	..	..	..	..
		L.	..	..	..	375·3	368·3	354·8	..	292·0	291·2	230·2	218·2	..	..	138·0	..	..	..	..	..
741	?	L.	426·0	423·0	63·1	354·0	346·0	331·8	..	..	..	243·7	231·2	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
743	?	L.	..	..	..	359·2	352·3	336·8	..	..	..	..	..	..	..	..	..	..	..	..	..
744	?	R.L.	l 437·0	l 434·3	..	r 373·0	r 364·3	r 350·5	..	..	..	..	..	..	..	..	..	..	..	..	..
746	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	160·0	..	..	..	..	..
748	♂	R.	441·2	438·0	69·8	372·3	364·1	349·0	..	316·0	314·3	256·2	242·3	275·0	273·7	154·0	87·2	102·0	..	..	..
		L.	438·0	436·2	70·5	375·2	368·0	352·3	..	314·8	312·7	..	..	..	..	151·1	..	..	..	..	..
749	♀	R.L.	..	..	..	r 333·7	r 323·0	r 309·0	l 312·0	..	..	..	..	..	..	..	..	..	..	..	..
751	♀	R.	397·4	395·0	60·4	338·0	331·2	319·0	..	297·5	293·4	224·0	212·4	243·0	237·4	137·0	..	..	..	..	..
		L.	..	..	..	340·0	332·0	320·0	..	290·3	285·8	221·5	210·0	242·0	237·0	..	..	..	..	..	..
751x	?	R.	..	..	..	..	..	..	..	..	..	..	..	266·8	261·5	..	..	..	..	..	..
		L.	430·2	426·5	..	..	..	..	..	300·2	299·6	240·0	227·2	261·0	254·0	..	..	..	..	..	..
753	♀	R.	444·2	440·1	68·4	361·2	353·0	338·2	..	..	..	..	..	..	..	..	87·0	102·0	..	..	..
		L.	442·0	438·0	70·1	359·0	351·5	337·0	..	306·1	305·3	236·6	222·3	..	..	147·2	..	..	..	..	..
754	♀	R.	454·0	450·8	..	369·0	362·0	348·0	..	..	..	..	..	..	..	..	87·0	110·5	..	..	..
		L.	455·0	452·6	..	375·0	366·5	352·3	359·5	307·0	303·2	..	..	..	..	140·0	..	..	..	97·2	108·3
756	?	R.	..	..	..	..	..	329·0	..	..	..	..	..	..	..	..	..	..	..	..	..
759	?	R.	..	..	..	..	..	..	353·4	..	..	..	..	..	..	..	..	..	..	..	..
765	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	152·1	..	..	..	..	..
800	?	R.	421·0	414·7	66·0	343·0	335·0	321·4	329·0	..	..	..	..	..	..	..	..	..	..	..	..
804	♀	R.	445·5	..	..	361·3	352·0	338·3	..	308·0	302·0	237·2	224·0	..	..	..	..	..	..	..	..
		L.	442·4	440·8	69·5	358·2	349·0	336·0	351·7	302·0	..	..	..	..	..	..	..	..	..	..	..
810A	?	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	94·2	107·1	..	..	..
819	?	L.	..	..	..	..	..	..	..	..	..	220·3	208·5	..	..	..	..	..	..	..	..
823	♂	R.	..	..	..	388·9	379·8	363·4	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	393·2	384·3	369·9	..	322·6	319·4	260·2	247·0	280·2	278·1	152·2	..	..	..	..	..
827	♀	R.	412·3	408·3	..	..	..	..	..	290·4	288·3	223·3	210·0	..	..	..	..	..	..	..	..
		L.	419·3	415·1	..	330·3	321·7	310·3	..	286·5	..	221·0	207·3	..	..	..	..	..	..	..	..
828	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	154·2	..	..	..	..	..
829	♀	R.	440·0	432·8	..	367·0	358·0	347·0	354·8	..	..	..	..	..	..	..	112·1	115·2	..	..	..
		L.	..	..	..	369·0	360·6	348·5	..	..	..	..	..	..	..	..	..	..	..	..	..
830	?	L.	..	..	..	..	..	..	..	..	..	252·7	240·3	..	..	..	..	..	..	..	..
832	♀	R.	398·0	393·2	..	327·7	318·9	307·3	..	282·9	282·1	219·4	209·0	..	233·7	141·2	97·4	104·0	..	..	..
		L.	397·0	394·0	..	327·0	319·2	307·8	..	277·0	276·8	219·3	209·2	..	..	..	..	..	..	..	..
833	?	R.	..	..	..	..	..	..	375·0	..	..	..	..	..	..	147·5	111·0	118·0	..	..	..
834	♀	R.L.	..	..	..	l 341·5	l 336·0	l 322·1	..	..	..	..	..	r 251·2	r 247·0	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
838	♂	R.L.	..	..	..	r 389·0	r 380·2	r 365·0	..	l 336·0	..	..	r 242·3	..	..	..	..	..	..	..	..
840	♂	R.	493·2	491·5	..	..	..	..	..	362·4	360·8	..	..	..	..	173·4	90·3	112·2	..	..	..
841	♂	R.	443·7	441·8	72·4	369·0	359·0	345·0	356·8	..	..	..	..	..	..	..	..	..	..	..	..
		L.	447·0	444·5	71·9	367·2	355·0	341·4	..	..	..	..	..	..	..	..	..	..	..	..	..
842	♀	R.	..	..	..	..	..	..	..	..	..	..	..	259·4	254·0	136·0	..	..	..	..	..
		L.	..	..	..	..	..	..	..	304·0	301·7	229·8	217·4	254·0	250·0	..	..	..	..	..	..
843	♂	R.	488·2	487·0	..	..	..	..	..	..	..	..	..	..	..	148·6	..	..	..	..	..
		L.	485·9	484·2	..	419·8	410·0	394·3	397·4	..	..	..	..	..	..	153·6	..	..	..	..	..
844	♂	R.	479·0	475·8	..	..	..	..	..	..	..	..	..	287·0	279·7	146·6	..	..	..	..	..
		L.	..	..	..	..	..	..	..	329·0	327·6	255·4	242·0	..	..	..	..	..	..	..	..
854	♀	R.	..	..	..	..	..	..	..	315·4	313·2	260·0	247·8	..	..	150·0	117·6	119·0	..	..	..
		L.	..	..	..	..	..	..	..	304·1	303·0	..	..	..	..	149·5	..	..	..	..	..
862	♀	R.	421·0	418·0	..	..	..	323·0	333·0	295·7	293·0	..	208·0	238·4	235·3	..	..	..	..	..	..
		L.	..	..	..	347·0	337·5	323·0	333·0	286·4	284·0	216·2	204·2	235·2	231·2	133·2	..	..	..	..	..
863	♀	R.	..	..	..	353·0	345·0	332·0	335·0	..	..	234·6	224·0	..	250·0	141·0	..	..	..	..	..
		L.	416·0	415·6	..	355·2	346·6	334·0	..	289·2	289·1	..	..	..	..	141·8	..	..	..	..	..
864	♂	R.	443·5	442·6	..	391·3	380·4	365·7	..	..	..	..	..	284·3	279·7	..	81·3	104·9	..	..	..
		L.	442 3	441·8	..	..	..	..	..	..	..	..	..	..	..	152·0	..	..	..	..	..
867	♀	R.	459·2	452·8	70·7	395·0	387·0	373·0	387·2	316·0	308·3	..	..	..	..	..	..	..	..	..	..
		L.	462·2	..	..	392·1	384·0	371·2	387·2	..	..	..	..	..	..	..	..	..	..	..	..
869	♀	R.	412·4	408·0	58·8	345·4	338·0	324·0	..	..	..	233·5	224·0	256·7	249·3	..	..	..	..	..	..
		L.	412·0	410·9	..	343·0	335·0	321·3	330·0	288·7	286·8	..	..	..	..	..	..	..	..	..	..
870	?	R.L.	..	..	..	..	..	l 321·0	l 332·8	l 274·0	l 272·3	r 226·3	r 215·0	l 243·0	l 239·0	..	..	..	..	..	..
871	♀	R.	434·8	432·7	65·5	380·0	371·0	356·0	..	304·4	297·6	..	..	271·0	266·0	..	..	..	..	..	..
		L.	433·0	431·0	66·8	379·2	371·4	356·8	..	..	..	245·2	231·6	..	..	..	..	..	..	..	..
873	♀	R.	..	..	..	..	..	331·2	344·0	..	..	228·6	217·3	..	..	..	99·3	108·3	..	..	..
		L.	411·5	..	..	355·0	346·2	333·0	..	..	..	..	..	..	..	..	..	..	..	..	..
874	♂	R.	?457·7	?456·1	..	387·0	377·0	360·5	..	..	..	253·0	239·2	?281·2	?274·7	158·0	..	..	..	..	..
		L.	446·2	445·2	..	..	..	..	..	321·0	..	250·5	237·2	..	..	..	..	..	..	..	..
875	♂	R.	..	..	..	403·7	396·0	379·3	..	357·0	352·2	..	..	..	..	..	..	..	..	..	..
875x	?	R.	..	..	..	..	..	..	..	335·9	334·5	..	..	..	..	..	..	..	..	..	..
876	?	R.	..	..	..	419·3	410·8	394·0	..	..	..	..	..	..	..	..	..	..	..	..	..
877	♂	R.	..	..	..	..	395·3	380·0	..	..	..	268·2	254·0	..	..	..	101·0	115·0	..	..	..
		L.	466·0	463·2	72·5	400·0	388·9	373·5	382·0	326·4	325·2	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
878	♀	R.	..	..	..	..	..	..	..	300·3	293·2	..	..	..	..	140·2	..	..	..	..	..
		L.	..	..	..	..	..	..	362·0	291·5	289·8	..	..	..	..	144·0	..	..	..	..	..
879	?	L.	..	..	..	..	..	..	..	311·8	..	..	..	..	..	..	..	..	..	..	..
880	♂	R.	..	..	..	..	..	349·3	363·3	326·2	322·7	248·4	233·2	267·6	263·6	..	..	..	..	..	..
		L.	433·0	428·2	..	..	..	..	364·0	..	..	249·2	233·6	270·3	263·7	149·5	..	..	..	..	..
881	♂	R.	..	..	..	385·8	375·3	360·9	374·3	..	..	..	..	..	270·4	..	..	..	..	..	..
		L.	456·0	..	..	379·0	370·3	357·0	..	314·5	..	255·8	242·0	275·2	270·3	..	..	..	..	98·3	126·7
882	♂	R.	..	..	..	..	..	..	..	..	..	261·0	247·0	..	..	149·1	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	255·0	241·2	275·5	270·0	..	..	..	..	..	..
883	♂	R.	..	..	..	..	..	..	..	317·0	314·8	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	336·6	..	322·0	..	..	232·5	265·0	261·7	..	..	..	..	..	..
884	♀	R.	..	..	..	..	..	..	381·4	..	..	252·8	241·0	..	..	..	106·0	126·6	..	..	..
		L.	..	..	..	396·8	387·0	374·3	..	..	..	..	..	275·6	269·6	156·0	..	..	..	..	..
1004	?	R.	..	..	..	338·0	329·0	315·3	..	..	..	..	..	..	..	..	..	..	..	..	..
1006	♂	R.	..	..	..	388·4	379·8	366·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	365·4	..	..	..	260·3	247·0	..	..	..	..	..	..	..	..
1007	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	148·0	..	..	..	..	..
1009	?	R.	..	..	..	..	..	..	..	..	..	265·8	251·5	..	..	..	..	..	..	..	..
1013	?	R.	..	..	..	..	..	..	333·0	..	..	..	..	..	..	..	..	..	..	..	..
1015	♀	R.	458·0	450·0	65·9	..	..	..	..	332·2	329·3	..	..	..	..	..	102·2	116·1	..	..	..
1017	?	R.	..	..	..	..	..	..	..	315·4	312·1	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	302·7	300·2	..	..	..	..	..	..	..	..	..	..
1022	?	R.	484·2	482·0	..	417·7	407·3	390·4	..	349·3	345·3	..	..	..	..	..	..	..	..	..	..
1025	?	R.	..	..	..	..	363·0	350·1	..	..	..	..	..	..	..	..	..	..	..	..	..
1026	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	120·0	..	..	..	..	..
1028	?	R.	435·8	427·0	63·6	376·0	365·5	353·0	365·2	..	..	..	..	..	..	..	..	..	..	..	..
		L.	441·4	433·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1031	♀	R.	..	..	..	349·5	341·2	328·5	..	284·4	282·1	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	349·0	342·0	329·4	..	..	..	..	..	..	238·0	..	..	..	..	..	..
1037	♀°	R.	416·2	410·0	64·5	341·0	330·3	317·4	..	290·4	..	..	..	253·0	246·3	138·6	..	..	..	..	..
		L.	421·1	..	..	340·5	331·5	319·3	..	..	..	232·0	218·0	..	251·0	..	..	..	..	..	..
1040	♀	R.	441·0	438·0	64·7	..	..	..	..	307·2	304·5	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	304·3	301·8	..	..	..	..	..	..	..	..	..	..
1041	?	R.L.	*r* 450·0	*r* 443·0	..	*l* 381·2	*l* 371·3	*l* 357·2	*l* 369·0	..	..	..	..	..	..	..	..	..	..	..	..

General Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
1047	?	R.	..	..	..	..	..	..	359·8	..	..	..	..	..	..	..	..	..	..	..	..
1048	?	R.	..	..	..	347·2	338·0	325·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	422·0	417·3	71·1	348·3	339·2	326·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1100	?	R.L.	*l* 399·8	*l* 398·8	*l* 64·3	..	..	*l* 308·8	..	*l* 278·7	*l* 275·0	*l* 214·2	*l* 201·2	*r* 253·3	*r* 249·3	*r* 152·2	..	..	..	..	..
1101	♀	R.	..	..	..	390·0	380·2	366·6	..	..	..	..	..	..	..	128·0	..	..	..	..	..
		L.	..	..	..	390·4	380·9	368·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1102	♀	R.	442·0	436·2	72·7	372·7	363·0	345·5	..	321·0	319·2	250·3	235·6	271·2	265·0	136·8	..	..	149·8	96·0	113·2
		L.	447·2	443·3	..	376·5	366·8	350·3	..	315·1	314·0	..	..	..	..	136·8	..	..	..	97·0	111·0
1103	♀	R.	447·0	445·1	..	370·0	360·0	346·0	259·0	..	..	..	..	..	..	137·0	93·0	110·3	129·3	90·4	106·3
		L.	448·4	446·0	..	369·6	359·5	347·3	..	298·0	295·3	242·0	231·0	258·8	252·8	..	..	..	..	..	..
1104	♀	R.	399·0	393·9	63·1	328·0	320·3	307·0	326·3	..	..	220·4	207·0	..	..	..	..	..	..	..	..
		L.	..	..	..	330·2	323·0	310·2	..	277·1	273·6	..	..	..	..	..	..	..	..	..	..
1105	♀	R.	430·2	426·0	66·4	354·0	346·0	333·8	339·0	305·0	303·4	239·0	227·3	254·5	248·9	141·0	..	..	..	..	..
		L.	426·3	424·0	68·7	..	..	..	..	295·3	294·4	239·0	228·0	256·7	251·0	..	..	..	143·8	89·3	110·1
1106	♀	R.	421·0	416·0	65·1	353·0	343·6	331·4	346·0	298·3	296·8	..	..	259·2	253·1	132·3	..	..	..	..	..
		L.	422·3	418·3	62·6	356·3	346·4	333·5	344·2	290·3	287·3	236·1	224·5	..	..	..	..	..	..	..	..
1107	♀	L.	..	..	..	326·0	316·0	304·0	..	285·0	..	..	..	..	238·0	..	..	..	..	..	..
1109	♀	R.	..	..	..	347·0	337·0	324·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1180	?	R.	..	..	..	..	..	..	..	299·3	298·8	..	..	..	..	..	..	..	..	..	..
1212	♂	R.	..	..	..	..	..	356·0	..	..	..	235·2	223·8	..	..	152·0	78·0	110·9	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	..	..	151·6	..	..	..	..	..
1216	?	L.	..	..	..	352·0	344·6	332·3	..	..	..	..	..	..	..	..	..	..	..	..	..
1251	?	R.	..	..	..	358·0	348·3	335·0	343·5	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	358·8	350·5	337·0	348·0	..	..	..	..	..	..	..	..	..	..	..	..
127	?	L.	..	..	..	..	..	372·1	..	..	..	..	..	..	..	..	..	..	..	..	..
1300	♀	R.	..	..	..	331·4	326·4	312·0	..	..	..	219·5	208·0	243·0	236·3	..	..	..	..	..	..
		L.	392·0	390·3	..	331·8	326·8	312·8	310·2	..	..	..	..	..	..	142·1	..	..	..	..	..
1313	♀	R.	389·4	387·8	..	..	..	..	315·0	292·5	284·8	..	..	..	..	..	95·0	109·0	..	..	..
		L.	389·2	388·0	..	329·9	320·2	307·0	317·5	..	..	..	..	..	..	..	..	..	..	..	..
1330	♂	R.L.	..	..	..	..	..	..	*l* 382·8	*r* 328·2	*r* 325·8	..	..	..	..	..	..	..	..	..	..
1333	?	R.	..	..	..	353·9	344·3	330·5	..	..	..	..	..	..	..	..	..	..	..	..	..
1335	♀	R.	418·2	413·9	..	344·8	338·0	326·0	344·0	292·5	291·0	236·0	223·4	..	..	148·2	..	..	..	..	..
		L.	422·0	416·2	62·8	347·0	339·1	325·5	..	290·0	287 0	232·4	220·0	..	..	148·2	..	..	..	..	..
1344	♀	R.	..	..	..	..	..	..	321·0	..	..	234·0	223·0	..	..	119·7	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
1344	♀	L.	..	..	..	..	..	..	..	299·0	..	..	..	251·3	248·3	131·2	..	..	..	..	..
1349	♀	R.	414·0	412·0	..	..	..	..	..	307·2	306·3	..	..	..	..	..	89·8	105·8	..	..	..
		L.	410·3	408·9	..	..	..	..	324·0	..	..	..	..	..	..	..	..	..	..	..	..
1354	♂	R.	468·0	..	..	376·3	365·0	353·7	..	..	..	254·8	241·0	..	..	..	..	..	..	..	..
		L.	468·0	464·5	..	..	..	355·2	368·0	..	..	..	..	..	..	..	..	..	..	..	..
1362	?	L.	436·2	433·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1415	♂	R.	501·5	495·0	..	..	..	398·3	408·0	368·2	364·3	..	..	..	..	..	..	..	..	..	..
		L.	499 2	495·0	..	423·0	412·5	399·0	406·3	368·0	363·8	277·8	263·2	302·8	294·0	..	..	..	..	..	..
1415x	?	R.L.	*l* 448·0	*l* 444·5	..	*l* 373·0	*l* 364·2	*l* 349·5	..	*r* 331·2	*r* 329·2	*l* 255·4	*l* 242·0	..	..	..	..	..	..	..	..
1417	♂	R.	457·8	454·0	..	401·0	392·0	378·0	390·8	..	..	..	..	..	..	..	107·0	124·0	..	..	..
		L.	462·4	458·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1417*a*	♀	R.	..	..	..	323·0	313·8	301·8	315·0	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	324·0	314·7	303·0	316·2	..	..	..	..	233·2	228·0	..	..	..	..	..	..
1418	♂	R.	467·0	464·0	..	395·0	387·0	370·8	..	..	..	..	..	..	..	..	103·2	112·3	..	..	..
		L.	466·0	464·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1419	♀	R.	..	..	..	348·5	340·0	326·5	..	..	..	227·3	213·7	..	..	..	..	..	..	..	..
		L.	421·0	418·3	..	348·2	333·3	326·3	..	286·0	284·0	226·0	212·0	246·0	238·0	..	..	..	..	..	..
1430	♀	R.	406·0	400·8	..	342·3	329·5	317·0	337·5	..	..	..	..	..	..	..	..	..	..	..	..
		L.	401·4	398·5	..	..	..	..	336·3	..	..	..	..	..	..	..	..	..	..	..	..
1437	♂	R.L.	*r* 522·7	*r* 522·7	..	..	..	*r* 432·5	..	*l* 365·7	*l* 363·2	..	..	..	..	..	..	..	..	..	..
1443	♂	R.	471·4	470·0	..	391·5	382·4	366·8	..	330·0	327·6	..	..	277·3	273·0	..	..	..	..	..	..
		L.	468·4	467·8	..	395·8	385·3	370·0	..	328·2	323·2	..	..	..	..	..	..	..	..	..	..
1452	♂	R.L.	..	..	..	*l* 420·8	*l* 409·4	*l* 393·0	..	*r* 357·3	*r* 348·8	..	..	..	..	..	..	..	..	..	..
1456	♀	L.	417·3	414·3	..	..	..	..	..	298·0	294·0	..	..	..	..	..	..	..	..	..	..
1457	♀	R.	446·5	445·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1459	♀	L.	..	..	..	..	..	..	..	314·9	..	..	..	..	..	..	..	..	..	..	..
1460	?	R.	..	..	..	..	..	..	..	320·6	318·2	..	..	..	..	..	..	..	..	..	..
1462	?	L.	464·2	463·5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1464*b*	?	L.	492·3	489·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1466	?	L.	448·0	446·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1468	♀	R.	433·0	430·2	..	364·0	353·3	339·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	435·2	431·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1469	?	R.	..	..	..	..	..	..	..	298·2	294·7	..	..	..	..	..	..	..	..	..	..
1475	?	R.L.	*r* 498·6	*r* 497·3	..	..	..	..	..	*l* 306·8	*l* 306·3	..	..	..	..	..	..	..	..	..	..

General Graves.—*Skeletons* (continued).

No.	Sex	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
1477	?	R.	446·2	438·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1491	?	R.	490·9	487·0	..	418·0	409·9	394·8	..	335·7	..	..	..	..	..	..	..	..	..	..	..
1503	♂	R.	455·7	454·0	..	388·0	378·8	361·2	369·5	..	..	..	..	..	..	..	101·1	108·9	..	..	..
		L.	457·7	457·3	..	391·6	381·2	362·8	373·0	..	..	..	..	..	..	..	..	..	..	..	..
1506	♂	R.	469·3	463·8	..	400·7	391·2	377·0	..	..	..	260·5	245·0	..	..	..	..	..	..	..	..
		L.	..	..	..	403·7	394·0	379·5	..	325·0	322·3	259·8	244·0	282·0	276·8	..	..	..	..	..	..
1545	♂	R.	536·5	531·8	..	437·9	428·6	412·2	..	..	..	286·2	273·0	..	..	..	..	..	..	..	..
		L.	530·2	528·2	..	442·0	429·7	413·0	..	378·5	376·7	..	..	..	..	170·6	..	..	..	..	..
1546	♂	R.	463·8	461·2	..	395·4	383·2	364·8	380·3	333·0	327·0	263·6	247·5	283·0	277·0	..	110·2	114·3	..	..	..
		L.	459·4	458·0	..	394·5	384·0	366·5	378·9	326·4	322·8	257·0	242·1	278·0	271·0	..	..	..	160·8	109·3	110·8
1552	?	L.	442·2	442·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1554	?	L.	..	..	..	397·0	387·2	373·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1557	?	R.	427·6	..	..	..	..	..	..	304·0	301·0	..	..	..	..	..	..	..	..	..	..
1586	♂	L.	466·5	465·0	..	..	..	..	..	322·0	315·0	..	..	..	..	..	..	..	..	..	..
1587	?	R.	490·4	486·4	..	..	..	..	..	344·2	343·8	..	..	..	..	..	..	..	..	..	..
		L.	489·8	488·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1587E	?	R.	..	..	..	..	..	..	..	334·5	334·0	..	..	..	..	..	..	..	..	..	..
1594	♀	R.	..	..	..	..	..	..	..	305·2	304·2	..	..	..	..	..	..	..	..	..	..
1603	?	L.	..	..	..	..	..	..	..	334·0	331·2	..	..	..	..	..	..	..	..	..	..
1604	♀	R.	..	..	..	..	..	..	..	282·4	281·0	..	..	..	..	..	..	..	..	..	..
1606E	?	R.	416·0	410·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1607	?	L.	..	..	..	..	..	..	..	296·1	295·8	..	..	..	..	..	..	..	..	..	..
1607W	?	R.	407·0	398·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1608	?	L.	..	..	..	..	..	..	..	290·3	285·0	..	..	..	..	..	..	..	..	..	..
1609	♂	R.	438·0	437·0	..	370·2	358·6	343·2	..	325·2	316·8	..	..	..	..	..	..	..	..	..	..
		L.	438·0	437·1	..	373·0	360·5	345·4	..	..	..	..	..	..	..	..	..	..	..	..	..
1610	?	R.	..	..	..	..	..	..	..	303·3	297·8	..	..	..	..	..	..	..	..	..	..
1611	?	R.	..	..	..	423·0	409·0	393·0	..	..	..	279·3	264·2	302·0	294·0	..	..	..	..	..	..
		L.	466·7	464·0	65·1	425·4	412·0	396·2	..	347·8	347·3	..	..	..	..	..	..	..	..	..	..
1612	?	R.	444·1	441·2	..	..	..	..	..	325·1	324·2	257·3	241·2	..	..	..	..	..	..	..	..
1613W	?	R.	..	..	..	366·0	358·0	345·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1614	?	R.L.	r437·4	r432·6	..	l388·3	l379·5	l366·0	..	r298·5	r294·7	..	..	..	..	..	..	..	..	..	..
1619	?	R.	434·3	429·9	62·5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1624	?	R.	413·0	407·1	69·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to Centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
1625	?	R.	411·6	405·5	59·6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1626	?	R.	459·7	453·0	73·5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1628	?	R.	..	..	..	..	..	..	..	..	..	..	..	284·3	277·0	..	..	..	..	..	..
1631	?	R.L.	r 408·3	r 402·0	..	..	..	..	..	l 334·5	..	..	..	..	..	..	..	..	..	..	..
1632	?	R.	449·8	448·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1633	?	L.	412·7	408·6	60·9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1637	?	R.	421·7	420·1	64·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1639	?	L.	446·0	441·0	62·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1640	?	R.	473·2	467·3	72·5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1641	♂	R.	460·7	454·3	70·0	..	..	354·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	379·5	369 0	354·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1643	♀	L.	464·2	462·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1644	♂	R.	..	..	..	405·3	396·3	380·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1651	♂	L.	452·2	451·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1653	?	R.L.	r 442·7	r 442·0	..	..	..	..	..	l 312·2	l 310·0	..	..	..	..	..	..	..	..	..	..
1661	?	R.L.	r 454·5	r 454·1	..	..	..	..	..	l 316·0	l 312·3	..	..	..	..	..	..	..	..	..	..
1666	♀	R.	447·7	442·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1667	♂	R.	459·8	459·0	..	..	..	..	..	330·3	327 3	..	..	..	..	..	..	..	..	..	..
1668	♂	R.	467·2	463·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	467·0	465·2	..	..	..	..	..	319·9	316·4	..	..	..	..	..	..	..	..	..	..
1669	?	R.	..	..	..	..	..	..	..	317·0	314·9	..	..	..	..	..	..	..	..	..	..
1670	♀	R.	437·7	433·2	..	382·8	374·7	362·7	..	300·3	297·7	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	293·0	292·2	..	..	..	..	..	..	..	..	..	..
1672	♀	R.	413·0	409·8	..	344·5	336·0	322·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1674	?	R.L.	r 431·8	r 431·2	..	r 364·0	r 353·0	r 339·8	..	l 298·0	l 296·5	..	..	..	..	..	..	..	..	..	..
1675	♀	R.L.	r 468·5	r 458·8	..	..	..	..	..	l 309·6	l 298·9	..	..	..	..	..	..	..	..	..	..
1676	?	R.	503·2	496·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1684	?	L.	449·3	447·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1685	♀	R.	444·3	440·0	..	..	..	..	..	310·3	307·5	..	..	..	..	..	..	..	..	..	..
1686	♀	R.	430·0	429·5	..	..	..	..	..	312·0	306·3	..	..	..	..	..	..	..	..	..	..
1687E	?	R.	..	..	..	369·8	362·2	350·6	..	..	..	..	..	..	..	..	..	..	..	..	..
1689	?	R.	..	..	..	..	..	..	..	319·5	313·8	..	..	..	..	..	..	..	..	..	..
1690	?	R.	528·9	519·0	..	..	..	..	..	371·5	361·8	..	..	..	..	..	..	..	..	..	..
1692	♂	R.	427·3	424·8	..	..	..	..	..	313·3	312·0	..	..	..	..	..	..	..	..	..	..

General Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maxi-mum.	Femur. Ob-lique.	Femur. Neck.	Tibia. Maxi-mum.	Tibia. Ex-cluding spine.	Tibia. Centre to centre.	Fibula. Maxi-mum.	Humerus. Maxi-mum.	Humerus. Ob-lique.	Radius. Maxi-mum.	Radius. Centre to centre.	Ulna. Maxi-mum.	Ulna. Ex-cluding styloid.	Clavicle Maxi-mum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
1692	♂	L.	..	..	..	..	..	..	..	310·4	309·0	..	..	..	..	..	..	..	..	..	..
1718	?	R.	437·2	434·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1720	?	L.	423·3	418·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1729	♂	R.	487·4	484·2	..	422·0	411·2	394·9	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	486·4	485·0	..	423·4	414·8	399·3	..	334·0	331·0	..	..	..	..	..	..	..	..	..	..
1733	♂	R.L.	r451·0	r449·7	..	r381·0	r373·8	r359·4	..	l314·0	l310·0	..	..	..	l269·9	..	..	..	..	..	..
1735	?	R.	451·8	447·0	..	377·3	369·3	357·0	..	..	..	..	..	269·0	263·8	..	..	..	..	..	..
		L.	455 7	453·3	..	372·0	362·2	351·0	..	..	..	244·2	234·0	..	..	..	..	..	..	..	..
1737	?	L.	..	..	..	..	..	..	..	333·0	328·0	..	..	..	..	..	..	..	..	..	..
1738	?	R.L.	..	..	..	r372·5	r363·8	r348·0	..	l294·2	l293·5	..	..	..	..	..	..	..	..	..	..
1739	♀	R.	448·0	436·0	..	380·2	369·0	352·5	..	..	..	..	..	280·0	277·2	..	..	..	..	..	..
		L.	447·9	437·2	..	..	..	..	..	321·0	315·8	254·7	242·6	..	..	..	..	..	..	..	..
1739x	♀	R.	407·0	396 5	..	340·0	329·0	314·5	..	295·3	289·4	227·3	214·6	247·2	242·2	..	..	..	..	..	..
		L.	408·0	..	..	339·0	329·0	313·5	..	289·3	284·0	..	..	242·2	237·3	..	..	..	..	..	..
1743	♀	L.	425·2	420·0	..	368·3	359·3	345·3	..	..	..	..	..	..	..	..	..	..	..	..	..
1745	♀	R.	430·0	427·6	..	..	..	..	..	297·4	294·2	..	..	..	..	..	..	..	..	..	..
1746	?	L.	..	..	..	..	..	..	..	293·9	292·0	..	..	..	..	..	..	..	..	..	..
1747	?	R.	..	..	..	..	..	..	..	329·3	328·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	315·5	314·0	..	..	..	..	..	..	..	..	..	..
1748	?	R.	457·0	453·0	..	..	..	..	..	330·9	329·2	..	..	..	..	..	..	..	..	..	..
1751w	♀	R.	410·8	408·2	..	341·8	334·0	321·3	..	288 2	285·2	..	..	..	..	..	..	..	..	..	..
		L.	409·8	408·0	..	343·5	334·7	322·8	..	282·0	280·0	231·3	219·5	253·0	248·8	..	..	..	..	..	..
1751E	♀	R.	402·0	398·9	..	349·3	340·4	325·7	..	289·3	288·0	231·3	218·2	253·1	250·4	..	..	..	..	..	..
		L.	404·0	401·3	..	352·0	341·0	329·0	..	282·0	278·3	227·0	214·0	250·5	247·0	..	..	..	..	..	..
1754	♀	R.	410·2	407·0	..	..	..	..	..	286·3	284·7	..	..	..	..	..	..	..	..	..	..
1755	?	R.	476·2	471·0	..	..	..	..	..	334·0	329·8	..	..	..	..	..	..	..	..	..	..
1758	♀	R	437 3	435·0	..	366·3	357·8	344·0	..	303·0	302·8	..	..	..	..	..	..	..	..	..	..
		L	..	..	..	362·5	353·6	340·8	..	299·8	296·0	..	..	..	..	..	..	..	..	..	..
1774	♀	R.	442·3	435·5	..	373·3	365·3	352·3	..	300·2	296·0	..	..	253·0	248·0	..	..	..	..	..	..
		L.	437·8	433·9	..	376 3	367·3	354·4	..	293·9	290·2	..	..	245·0	239·8	..	..	..	..	..	..
1775	♂	R.	416·8	414·0	..	373·3	363·4	348·0	362·0	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	366·3	356·0	341·8	..	310·0	309·8	..	..	..	..	..	..	..	..	..	..
1781	?	R.	..	..	..	..	..	..	..	301·0	299·3	..	..	..	..	..	..	..	..	..	..
1786	?	R.	435·0	432·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
1787	?	R.	453·0	448·3	..	375·0	363·3	349·9	..	319·6	313·8	247·4	234·5	266·0	261·6	..	..	..	..	..	..
		L.	451·5	449·0	..	379·5	368·0	355·0	..	319·0	312·6	..	..	265·4	264·0	..	..	..	..	..	..
1789	?	R.L.	r488·5	r483·2	..	..	..	..	..	l320·0	l318·0	..	..	..	..	..	..	..	..	..	..
1795	♂	R.	464·2	462·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1796	?	R.	455·0	451·1	..	385·0	377·4	362·0	..	..	..	257·5	243·3	277·0	270·3	..	..	..	..	..	..
		L.	453·4	451·3	..	386·8	377·3	363·5	..	..	..	..	..	275·6	269·5	..	..	..	..	..	..
1798	♀	R.L.	l398·9	l394·0	..	..	..	..	..	r277·0	r275·7	r216·5	r205·0	r240·8	r236·5	..	..	..	..	..	..
1803	♂	R.L.	l479·4	l475·8	..	r414·0	r403·3	r386·2	..	?l291·0	?l289·0	..	..	..	..	..	..	..	..	..	..
1814	♀	R.	..	..	..	366·3	358·0	344·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	425·3	422·0	..	364·3	356·0	343·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1817	♀	R.	..	..	..	..	..	..	..	303·0	299·8	..	..	265·3	260·8	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	301·2	298·8	240·8	228·0	..	..	..	..	..	..	..	..
1820E	?	R.	..	..	..	404·0	395·3	378·3	..	..	..	..	..	..	..	155·1	..	..	..	..	..
		L.	462·3	459·0	..	..	..	..	..	..	..	..	..	..	..	155·2	..	..	..	..	..
1820R	?	R.L.	..	..	..	..	..	r398·5	..	l305·0	l304·3	..	..	..	..	..	..	..	..	..	..
1820W	?	R.	454·0	447·0	66·7	389·0	377·4	365·4	..	313·1	312·9	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	394·0	381·3	367·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1839	♂	L.	499·2	498·3	..	419·0	407·8	393·0	..	350·4	344·5	..	..	..	..	..	..	..	..	..	..
1849	?	R.L.	r436·5	r431·1	..	..	..	..	..	l321·0	l317·6	..	..	..	..	..	..	..	..	..	..
1856W	♂	R.	485·0	482·0	..	414·0	404·0	388·3	..	..	..	..	..	..	..	..	..	..	..	..	..
1856E	?	L.	478·2	470·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1860	♀	R.L.	..	..	..	r367·5	r359·8	r346·3	..	..	..	..	..	l251·4	l246·8	..	..	..	..	..	..
1863	♀	R.	..	..	..	..	..	..	..	..	..	238·2	227·2	..	..	..	..	..	..	..	..
1865	?	R.	433·2	422·6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1866	♂	R.L.	r488·0	r485·3	..	..	..	..	..	l332·0	l326·5	..	..	..	..	..	..	..	..	..	..
1869	?	R.	446·5	443·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1874	?	R.	418·0	411·5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1875	♂	R.	442·0	441·0	..	376·5	369·0	354·5	..	318·0	317·1	..	..	272·0	267·8	..	..	..	..	..	..
		L.	450·0	449·4	..	381·0	372·0	357·5	..	..	..	..	..	..	..	..	..	..	..	..	..
1878	♂	R.	494·3	486·4	..	423·8	410·2	396·2	..	..	..	..	..	305·0	298·0	..	..	..	..	..	..
		L.	495·0	489·0	..	..	..	..	..	347·7	344·0	..	..	..	..	..	..	..	..	..	..
1879	?	R.	..	..	..	413·5	405·0	388·4	..	346·3	342·2	270·0	255·6	..	..	..	..	..	..	..	..
		L.	475·3	473·2	..	415·2	406·2	390·4	..	343·8	339·5	269·0	254·6	..	..	..	..	..	..	..	..
1885	?	R.L.	..	..	..	r361·3	r354·2	r342·0	..	l317·0	l307·2	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
1888	?	L.	..	..	..	366·8	358·0	338·8	..	..	..	..	..	..	..	..	..	..	..	..	..
1890	♂	R.L.	*l* 462·0	*l* 460·3	*l* 74·0	..	..	..	..	*r* 321·5	*r* 316·0	..	..	..	..	..	..	..	..	..	..
1896	?	R.	..	..	..	403·0	395·0	381·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1898	?	R.	460·7	458·8	79·5	396·0	386·2	368·3	..	335·5	332·1	..	..	..	..	..	..	..	..	..	..
1899	♂	R.L.	*r* 481·5	*r* 479·8	*r* 84·0	*l* 406·5	*l* 395·3	*l* 379·5	..	*r* 326·8	*r* 325·8	..	..	*r* 300·2	*r* 295·5	..	..	..	..	..	..
1901	?	L.	..	..	..	..	..	347·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1902	♀	R.	..	..	..	..	..	..	..	328·4	324·2	..	..	..	..	..	..	..	..	..	..
1905	?	R.	..	..	..	..	..	..	..	294·2	292·3	..	..	..	..	..	..	..	..	..	..
1909	?	R.	..	..	..	348·5	340·2	326·0	..	..	..	..	..	..	..	..	..	..	..	..	..
1914	♀	R.	426·0	421·0	..	358·2	350·0	337·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	422·2	421·0	..	..	..	..	..	290·0	288·0	..	..	..	..	..	..	..	..	..	..

GENERAL GRAVES.—*Non-skeletons.*

No Number. F.l. 476·0, 473·0; 463·8, ——; T.r. 396·3, 386·0, 372·0; 352·8, 344·2, 331·3; U.r. 266·0, 258·4.
30. H.l. 297·0, 296·3.
643. R.r 228·4, 215·0.
733. Cl.r. 126·7.
880. H.l. 307·0, ——.
1670. H.l. 289·2, 288·2.
1739. U.r. 286·2, 281·8.
1856w. F.r. 484·8, 481·6.

Q Graves.—*Skeletons.*

No.	Sex.	Side.	Femur. Maxi-mum.	Femur. Ob-lique.	Femur. Neck.	Tibia. Maxi-mum.	Tibia. Ex-cluding spine.	Tibia. Centre to centre.	Fibula. Maxi-mum.	Humerus. Maxi-mum.	Humerus. Ob-lique.	Radius. Maxi-mum.	Radius. Centre to centre.	Ulna. Maxi-mum.	Ulna. Ex-cluding styloid.	Clavicle. Maxi-mum.	Sacrum. Length.	Sacrum. Breadth.	Scapula. Length.	Scapula. Breadth.	Scapula. Infra-spinous length.
9 inside	?	L.	420·3	418·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	?	R.	..	..	..	398·0	390·5	375·7	..	..	..	..	..	..	..	..	..	..	..	..	..
26	?	R.	..	..	..	422·6	412·3	398·9	..	..	..	..	..	..	..	..	..	..	..	..	..
37	♂	R.	493·3	491·2	79·2	..	..	..	..	367·8	359·5	..	..	299·8	292·3	..	..	..	..	..	..
		L.	499·0	496·9	..	437·3	423·7	407·0	..	..	..	..	..	299·7	291·9	..	..	..	..	..	..
43	♂	R.	..	..	..	..	..	..	..	323·0	319·0	..	..	285·5	280·0	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	317·9	317·0	266·7	253·2	..	..	..	..	..	..	..	..
45	?	L.	348·0	344·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
47	?	R.	..	..	..	362·0	351·3	339·2	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	362·2	351·5	340·4	..	..	..	..	..	..	..	..	..	..	..	..	..
50	♀	R.	..	..	..	..	..	324·8	..	304·0	303·8	..	..	..	..	144·1	..	..	..	..	..
		L.	..	..	..	350·3	341·0	326·5	..	294·4	293·9	..	..	..	..	142·0	..	..	..	..	..
54	♂	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	98·9	124·3
		L.	..	..	..	..	..	..	..	..	..	..	..	..	..	151·0	108·5	104·3	..	98·5	121·4
59	♂	R.	475·0	472·0	..	..	..	..	..	328·0	322·2	..	..	288·0	281·0	..	99·5	111·2	..	..	..
		L.	472·0	470·0	..	416·5	407·0	394·3	..	326·0	320·3	264·8	253·0	283·5	275·8	..	..	..	..	..	..
59BB	?	L.	..	..	..	400·0	391·1	378·0	..	..	..	..	..	..	..	..	..	..	..	..	..
67	♂	R.	..	..	..	..	..	352·3	..	305·5	302·3	253·8	239·5	278·4	271·5	151·0	..	..	..	..	..
		L.	..	..	..	..	..	350·6	366·3	304·6	301·5	252·2	238·2	273·2	265·3	..	..	..	..	..	..
70	?	R.	..	..	..	351·4	344·2	329·3	342·3	..	..	..	..	..	..	..	..	..	..	..	..
73	?	R.L.	*r* 452·4	*r* 451·3	..	*l* 393·5	*l* 382·6	*l* 369·0	..	..	..	..	..	..	..	..	..	..	..	..	..
74	?	R.L.	..	..	..	..	..	..	*r* 369·5	..	..	..	..	*l* 268·8	*l* 261·3	..	..	..	..	..	..
77E	?	R.	..	..	..	..	..	..	..	313·0	309·9	278·6	265·0	..	..	..	..	..	..	..	..
		L.	460·0	454·0	..	..	..	..	..	305·5	304·0	..	..	295·0	290·8	..	..	..	..	..	..
77W	?	R.L.	..	..	..	*l* 380·8	*l* 370·3	*l* 359·0	..	..	..	*r* 240·9	*r* 230·0	..	..	..	..	..	..	..	..
79	?	R.	..	..	..	..	..	..	..	..	..	223·0	210·3	..	..	..	..	..	..	..	..
81	?	R.	..	..	..	..	..	..	..	..	..	266·2	251·8	..	..	..	..	..	..	..	..
82	♂	R.L.	..	..	..	..	..	..	..	..	..	..	..	..	*r* 260·2	*l* 146·3	88·1	97·2	..	..	..
83	♂	R.	..	..	..	366·5	356·4	344·0	..	305·2	305·0	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	366·0	356·2	344·2	..	..	..	..	..	..	..	..	..	..	..	..	..
85	?	L.	..	..	..	..	..	..	..	..	..	..	..	..	..	154·3	..	..	..	..	..
87	?	R.	..	..	..	..	..	..	375·3	..	..	..	..	..	..	..	..	..	..	..	..
92½	♀	R.L.	..	..	..	*l* 365·2	*l* 357·0	*l* 341·3	..	..	..	..	..	..	..	*r* 129·8	..	..	..	..	..

Q Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
101	?	R.	..	..	..	..	..	..	..	..	..	259·2	246·5	..	..	..	..	..	..	..	..
102	?	R.L.	..	..	..	r322·3	r314·0	r300·0	..	l270·0	..	..	..	..	..	..	..	..	..	..	..
103½	♀	R.	404·3	403·3	..	338·0	329·4	317·2	..	288·0	286·3	..	..	..	..	132·3	..	..	..	..	..
		L.	..	..	..	335·0	326·5	315·0	..	281·2	279·0	..	..	..	..	130·3	..	..	..	..	..
105	?	R.	419·6	417·0	..	353·2	340·8	326·5	..	306·0	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	351·0	339·0	324·5	..	..	..	..	..	..	..	..	..	..	..	..	..
105N	?	R.	..	..	..	368·0	358·3	344·0	..	..	..	..	..	..	..	..	..	..	..	..	..
108	?	L.	..	..	..	..	..	..	..	293·0	290·7	..	..	..	..	..	..	..	..	..	..
109	♀	R.	439·0	436·0	..	368·3	357·2	342·5	..	..	..	..	..	..	..	144·0	..	..	..	..	..
		L.	?433·2	?430·4	..	372·8	362·2	346·8	..	..	..	..	..	..	..	..	..	..	..	..	..
118	♂	R.	497·0	490·5	..	414·0	403·3	390·5	..	..	..	276·3	263·0	298·5	290·6	173·5	..	..	..	..	..
		L.	491·3	487·5	..	409·0	400·0	385·5	..	..	..	277·0	262·2	297·6	291·6	171·1	..	..	..	..	..
138	♂	R.	437·5	434·6	..	374·0	364·5	352·3	..	..	..	..	..	..	..	144·6	..	..	..	..	..
		L.	433·7	432·0	..	372·2	362·3	349·2	..	309·0	308·5	..	..	..	..	..	..	..	..	..	..
148	?	R.	..	..	..	..	..	..	..	..	..	..	..	278·0	274·3	..	..	..	..	..	..
158	?	R.	..	..	..	..	..	338·5	..	..	..	..	..	..	..	..	..	..	..	..	..
160	?	R.	..	..	..	..	..	..	..	329·0	326·0	..	..	..	..	160·8	..	..	..	..	..
161	?	L.	365·0	363·6	..	378·3	369·3	357·0	..	..	..	..	..	..	..	..	..	..	..	..	..
171	♂	R.	..	..	..	398·0	388·3	373·0	..	..	..	264·2	251·0	282·0	277·0	..	..	..	..	..	..
		L.	459·0	458·0	81·0	398·2	389·0	372·3	..	315·0	313·0	259·4	246·0	..	..	..	..	..	..	..	..
172	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	122·4	..	..	..	..	..
174	?	R.L.	..	..	..	..	..	..	..	l331·3	l330·0	r257·0	r244·0	..	..	..	..	..	..	..	..
176	?	R.L.	r462·9	r459·8	..	r388·3	r378·2	r363·8	..	..	..	..	..	l288·6	l282·0	..	..	..	..	..	..
176a	?	L.	..	..	..	..	..	..	..	297·0	297·0	..	..	..	..	..	..	..	..	..	..
176B	♂	R.	434·5	432·3	..	363·2	354·5	342·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	440·3	437·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
177	?	R.	..	..	..	..	..	..	..	307·0	303·0	242·4	229·3	..	..	..	..	..	..	..	..
		L.	432·0	427·2	..	..	..	..	..	302·7	298·8	..	..	..	..	..	..	..	..	..	..
178	♀	R.	437·0	434·8	..	..	..	..	..	309·5	304·7	..	..	..	..	..	105·6	120·5	..	..	..
		L.	..	..	..	..	..	..	..	304·5	299·8	..	..	262·3	257·0	..	..	..	..	..	..
186	?	R.	?427·3	?425·3	?70·5	356·3	349·0	337·0	..	307·3	302·0	..	..	..	..	..	..	..	..	..	..
		L.	?440·7	?436·7	..	..	..	338·0	..	..	..	..	..	..	..	..	..	..	..	..	..
191	?	R.	..	..	..	379·2	370·5	358·0	..	319·0	317·0	236·0	223·2	257·0	254·0	..	104·0	118·4	..	..	..
		L.	..	..	..	..	..	..	..	313·0	312·0	236·4	224·1	..	..	..	..	..	..	..	..

Q Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
201	♂	R.L.	..	..	..	..	..	..	..	*l* 320·3	..	*r* 260·2	*r* 246·0	..	*l* 270·2	..	..	..	..	..	..
202	♂	R.L.	*l* 408·0	*l* 406·2	..	*r* 332·0	*r* 322·0	*r* 311·2	..	*l* 275·0	*l* 273·0	..	..	..	..	..	..	..	..	..	..
203	♂	R.	462·4	459·8	..	..	..	..	..	328·1	323·0	..	..	..	..	..	..	..	..	..	..
208–1	?	R.	470·5	469·4	..	384·3	373·2	357·7	..	336·0	324·0	262·0	249·5	282·9	280·2	..	..	..	..	..	..
		L.	466·5	464·9	..	383·0	370·9	355·0	..	333·0	325·0	258·5	246·0	278·8	277·3	..	..	..	..	..	..
208–3	♂	R.	..	..	..	..	..	..	..	336·5	..	..	..	..	..	..	..	..	..	..	..
212	?	R.L.	..	..	..	*l* 357·2	*l* 347·2	*l* 336·0	..	*l* 326·0	*l* 324·5	*r* 226·8	*r* 215·0	*l* 248·3	*l* 241·3	..	93·4	117·8	..	..	..
212–1	?	R.	361·5	355·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	358·5	356·4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
212–2	♀	R.	..	..	..	..	..	..	..	252·3	251·2	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	247·6	245·8	..	..	..	..	..	..	..	..	..	..
215	♂	R.L.	*l* 492·0	*l* 488·0	..	..	..	..	..	*r* 347·0	*r* 342·3	*r* 277·7	*r* 263·4	..	..	..	..	..	..	..	..
216	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	281·5	..	..	..	..	..	..
217	♀	R.L.	..	..	..	..	..	..	..	*r* 286·0	*r* 286·0	..	..	*l* 244·8	*l* 239·0	..	..	..	..	..	..
222	?	L.	..	..	..	..	..	..	..	..	..	..	235·0	..	..	..	..	..	..	..	..
226	♂	R.	..	..	..	..	..	..	..	340·3	339·0	..	..	..	..	..	..	..	..	..	..
		L.	462·5	461·0	..	..	..	..	..	329·0	325·0	..		..	..	..	..	..	..	..	..
229	♂	R.	..	..	..	389·5	378·8	365·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	476·0	471·3	..	395·0	..	..	..	316·6	310·0	..	..	..	..	..	..	..	..	..	..
237	♂	R.	481 2	476·0	..	..	..	..	..	328·0	322·3	..	..	..	..	..	..	..	..	..	..
		L.	475·0	469·8	..	394·6	384·5	372·0	..	331·6	325·1	..	..	..	..	..	..	..	..	..	..
241	♂	R.L.	..	..	..	..	..	*r* 369·2	..	..	..	..	..	..	*l* 276·4	..	..	..	..	..	..
252	♀	R.	..	..	..	370·4	362·8	348·3	..	303·5	298·7	229·5	215·8	..	..	136·1	..	..	..	..	..
		L.	431·2	428·0	..	368·8	361·1	347·3	..	298·3	294·0	..	..	253·0	246·3	..	..	..	..	..	..
254	♀	L.	433·8	427·0	63·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
265	♀	R.	424·0	423·0	70·3	357·0	349·0	333·0	340·3	306·5	300·0	235·2	223·4	254·8	254·0	..	..	..	..	..	..
		L.	433·8	430·5	..	358·8	350·0	335·0	343·2	.	..	232·2	218·8	250·4	246·0	135·3	..	..	140·2	91·8	99·7
274	?	R.	..	..	..	385·4	375·8	364·0	..	..	..	251·0	239·3	272·0	267·3	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	309·0	306·0	246·0	234·0	..	..	..	..	..	..	..	..
276	♀	R.	..	..	..	..	..	..	..	285·2	282·1	215·0	203·4	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	303·5	..	282·0	280·1	208·2	198·2	..	..	..	..	..	..	..	..
278	?	R.	387·8	385·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
288	♀	R.	..	..	..	373·0	364·3	350·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	437·0	434·8	..	372·8	363·5	349·2	..	..	..	..	..	..	..	..	..	..	..	..	..

Q Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
297	?	R.	424·2	417·3	..	363·0	353·0	337·2	354·6	302·2	298·0	238·9	227·0	260·0	257·0	..	..	..	..	..	..
		L.	..	..	..	363·0	352·3	338·0	..	293·2	292·0	..	..	262·5	256·8	..	..	..	..	..	..
299	♀	R.	..	..	..	339·7	331·0	318·2	..	..	..	224·5	213·6	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	274·3	271·2	219·3	208·0	237·0	232·0	..	..	..	..	..	..
303	?	R.	426·3	422·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
305	♀	R.	..	..	..	347·0	337·4	325·3	..	289·2	288·9	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	348·0	337·0	324·8	..	287·7	285·8	236·0	222·0	..	..	138·0	..	..	..	..	..
311	?	R.	..	..	..	..	..	..	..	311·3	309·0	243·2	231·0	..	..	137·3	..	..	..	..	..
		L.	..	..	..	384·0	375·0	361·1	..	307·1	302·0	242·8	231·0	..	..	..	..	..	..	..	..
313	?	L.	..	..	..	..	..	..	..	323·2	321·4	..	..	..	..	..	..	..	..	..	..
320	♀	R.	409·6	408·0	64·7	336·2	328·1	313·3	..	287·0	284·0	..	..	..	..	..	..	..	..	..	..
		L.	413·2	411·2	..	..	..	..	..	..	..	230·0	220·0	252·0	249·0	..	..	..	..	..	..
322	♂	R.	..	..	..	378·2	371·5	355·0	..	311·2	307·0	..	..	..	..	..	..	..	..	..	..
		L.	448·0	441·2	72·1	376·0	368·3	353·0	..	307·0	301·2	239·8	225·6	..	..	..	..	..	..	..	..
323	♂	R.	431·0	428·0	..	..	..	..	..	..	..	243·8	231·0	..	..	..	..	..	..	..	..
		L.	430·3	428·0	..	363·3	354·0	339·0	..	..	..	..	..	260·0	255·0	..	..	..	..	..	..
324	♂	R.	..	..	..	..	..	385·0	..	342·8	338·1	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	334·3	331·2	..	..	..	..	157·2	..	..	..	..	..
325	♂	R.	430·4	429·8	68·4	..	..	..	..	..	..	241·7	227·1	..	..	147·3	98·0	107·3	..	..	..
		L.	437·5	436·2	67·7	358·0	348·3	335·3	..	307·8	305·0	..	..	..	..	..	..	..	..	..	..
326	♀	R.L.	*r* 426·2	*r* 425·8	*r* 63·6	*r* 368·0	*r* 357·2	*r* 343·0	..	*l* 297·5	*l* 291·2	..	..	*l* 249·6	*l* 246·0	..	..	..	..	..	..
333	?	R.	..	..	..	393·5	382·0	367·0	..	..	..	..	..	..	..	..	..	..	..	..	..
334	?	L.	503·0	501·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
336	?	L.	434·3	433·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
342	♀	R.	396·0	390·0	63·1	317·2	307·0	292·1	309·0	..	..	..	..	235·5	228·5	..	81·8	100·8	..	..	..
		L.	400·7	394·0	62·4	350·3	340·8	328·0	311·3	268·0	268·0	..	..	..	..	..	..	..	..	..	..
344	♀	R.	442·0	435·3	..	348·3	339·0	326·0	337·0	311·0	306·0	233·0	222·0	255·0	249·0	..	..	..	..	..	..
		L.	439·0	435·2	..	..	..	..	..	304·0	298·3	229·0	218·0	..	..	..	..	..	..	..	..
347	♀	R.	..	..	..	..	..	329·5	..	301·1	299·0	216·0	204·5	..	251·0	127·0	..	..	..	..	..
		L.	410·2	407·0	66·1	..	..	..	..	293·4	291·0	..	..	?239·1	?234·5	..	..	..	..	..	..
353N	?	R.	451·8	450·0	77·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	454·8	451·3	76·5	389·0	380·0	362·2	..	..	..	..	..	..	..	..	..	..	..	..	..
353S	?	R.	..	..	..	..	..	..	..	288·0	287·8	..	..	..	..	..	..	..	..	..	..
356	?	R.	..	..	..	..	..	..	..	..	..	253·0	241·5	..	..	..	..	..	..	..	..

Q Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre.	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
359–3	♂	R.	448·4	443·0	66·1	..	..	..	..	318·2	317·7	253·2	241·3	..	..	152·0	82·8	108·3	..	..	..
		L.	452·2	446·5	60·3	..	..	..	..	316·0	315·0	..	..	270·2	261·0	..	..	..	..	..	..
363	♂	R.	..	..	..	..	..	..	..	311·2	..	..	..	268·0	261·1	..	..	..	..	..	..
		L.	441·4	438·2	..	368·0	359·5	344·5	..	308·0	..	..	..	..	..	..	..	..	..	..	..
376	♀	R.L.	..	..	..	..	..	*l* 318·0	..	..	..	*r* 224·0	*r* 213·2	..	..	..	..	..	..	..	..
377	♀	R.	444·0	442·5	..	..	..	..	369·5	..	..	..	..	278·0	273·0	136·2	..	..	..	..	..
		L.	444·5	443·2	..	361·3	351·0	339·3	..	318·7	318·0	257·0	245·2	278·5	275·2	..	98·0	112·6	..	..	..
379	?	R.L.	*l* 412·4	*l* 409·0	*l* 68·3	*r* 333·2	*r* 324·3	*r* 312·1	..	..	..	..	..	..	..	..	..	..	..	..	..
383	♂	R.	..	..	..	..	..	358·0	..	..	..	..	..	..	..	..	..	..	..	..	..
384	♀	R.	378·3	376·2	58·9	..	..	..	..	279·8	278·3	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	274·0	272·2	..	..	211·0	199·0	..	..	..	..	..	..
396	?	L.	..	..	..	..	..	..	..	322·2	322·0	..	..	..	..	..	..	..	..	..	..
400	♂	R.	..	..	..	..	..	..	..	..	..	..	..	273·0	270·0	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	..	267·0	..	..	..	..	..	..
401	♂	L.	488·4	488·0	..	..	..	..	..	324·3	320·7	..	..	..	..	..	..	..	..	..	..
411	♀	R.L.	..	..	..	..	..	..	..	..	..	..	*r* 221·2	*r* 256·8	*r* 253·4	*l* 150·2	..	..	..	..	..
412	♂	R.	..	..	..	398·3	389·8	374·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	375·1	..	338·0	337·0	..	..	286·3	277·3	..	..	..	..	..	..
414	?	R.	..	..	..	..	..	..	..	280·2	279·5	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	278·0	277·2	220·0	207·0	238·5	233·8	..	..	..	..	..	..
415	?	R.L.	*l* 448·2	*l* 447·4	*l* 74·5	*r* 396·5	*r* 387·2	*r* 372·3	..	? *l* 272·0	? *l* 270·3	..	..	..	..	..	91·3	103·8	..	..	..
417	?	R.	..	..	..	359·3	349·4	335·3	..	289·0	286·0	..	..	..	..	..	..	..	..	..	..
		L.	414·7	412·8	66·6	363·0	354·0	341·2	..	286·7	284·8	..	..	..	..	..	..	..	..	..	..
430A	?	L.	..	..	..	..	..	..	..	..	..	..	..	246·0	241·0	..	..	..	..	..	..
431B	♀	R.	446·0	440·8	72·7	380·5	369·8	356·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	447·3	443·5	75·1	381·5	371·1	357·0	..	..	..	..	..	..	..	..	..	..	..	..	..
435	?	L.	422·3	420·6	70·4	..	..	..	..	284·0	277·2	..	..	..	..	..	..	..	..	..	..
436	♀	R.	434·0	432·0	..	376·3	367·0	352·0	..	314·3	309·9	..	..	..	..	..	..	..	..	..	..
		L.	449·3	446·4	67·4	..	..	..	..	309·8	305·4	..	..	261·2	257·5	..	..	..	..	..	..
437	?	R.	435·3	..	..	370·0	..	..	..	313·0	311·2	248·9	234·5	..	..	..	..	..	..	..	..
		L.	..	..	..	365·5	354·3	339·5	..	308·3	306·7	246·0	232·0	..	..	..	..	..	..	..	..
438	♂	R.L.	*l* 428·0	*l* 428·5	..	*r* 377·5	*r* 368·4	*r* 353·0	..	*l* 312·1	*l* 307·0	..	..	..	..	..	..	..	..	..	..
439	♂	R.	..	..	..	..	..	..	..	304·3	300·3	246·2	233·0	265·4	264·7	140·0	..	..	..	..	..

Q GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
439	♂	L.	431·8	..	..	..	..	..	..	299·0	294·3	..	..	..	..	..	..	..	..	..	..
445	?	R.	..	..	..	372·5	366·5	353·6	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	434·0	428·3	..	371·0	361·0	348·0	..	..	..	..	..	..	..	..	..	..	..	..	..
466(4)	♂	R.	411·8	..	..	..	..	..	..	287·0	283·5	221·2	209·8	..	..	..	..	..	..	..	..
		L.	411·2	407·0	..	343·3	334·0	320·0	..	280·0	276·0	..	..	242·8	236·6	..	..	..	..	..	..
472	?	R.L.	*l* 412·0	*l* 407·7	*l* 58·6	*l* 347·5	*l* 338·4	*l* 326·0	..	..	..	..	..	..	..	*r* 123·5	..	..	..	..	..
480	?	R.	..	..	..	..	..	..	..	..	..	227·0	214·3	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	224·0	211·8	..	..	..	..	..	..	..	..
481	?	R.	..	..	..	..	..	..	..	..	..	..	..	271·0	265·2	..	..	..	..	..	..
482	♀	R.	..	..	..	..	..	297·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	449·0	445·2	74·5	372·0	361·3	348·0	..	..	..	..	..	..	..	..	..	..	..	..	..
483	?	L.	..	..	..	384·0	373·4	358·2	..	..	..	..	..	..	..	..	..	..	..	..	..
487	♀	L.	..	..	..	..	..	..	..	298·3	292·3	..	..	..	..	..	..	..	..	..	..
492	?	L.	..	..	..	..	..	..	..	292·3	292·0	..	..	..	..	..	..	..	..	..	..
496	♂	L.	..	..	..	..	..	..	..	305·0	299·3	..	..	..	..	..	..	..	..	..	..
509	♀	R.	..	..	..	351·4	345·0	331·3	..	299·4	295·8	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	347·2	340·2	328·2	..	..	..	..	..	..	..	..	..	..	..	..	..
511	♀	L.	451·0	443·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
512	?	R.L.	..	..	..	*l* 345·5	..	*r* 326·0	..	..	..	..	..	..	..	..	..	..	..	..	..
528	♀	R.L.	*r* 415·5	*r* 413·4	..	..	..	..	..	*l* 293·0	*l* 287·2	*l* 213·5	*l* 202·0	*l* 240·2	*l* 234·5	*r* 140·0	..	..	..	..	..
544	?	L.	..	..	..	388·2	377·5	363·0	..	325·8	320·1	..	..	..	..	..	..	..	..	..	..
550	?	R.	..	..	..	..	..	..	..	294·5	291·3	..	..	..	..	..	..	..	..	..	..
560	?	L.	418·2	415·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
569A	♀	R.	427·0	423·2	..	..	..	..	..	..	..	..	..	250·5	244·5	126·8	..	..	..	..	..
		L.	..	..	..	..	..	..	..	290·2	288·7	227·5	216·5	248·4	242·4	128·3	..	..	..	..	..
569B	♂	R.L.	..	..	..	*r* 403·8	*r* 394·5	*r* 379·4	..	*l* 332·0	*l* 326·0	..	..	*r* 282·1	*r* 276·2	..	..	..	..	..	..
572	♀	R.	..	..	..	376·5	368·0	356·0	..	331·2	327·0	..	..	273·0	266·6	..	..	..	..	..	..
		L.	..	..	..	373·5	362·2	351·0	..	..	..	246·5	235·0	271·0	265·5	..	..	..	..	..	..
577	♂	R.	501·3	499·0	..	437·0	425·0	406·8	..	..	..	..	..	..	..	172·0	101·0	124·0	..	..	..
		L.	501·1	497·9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
586	?	R.	..	..	..	..	..	359·8	..	..	..	..	..	256·0	251·3	..	..	..	..	..	..
		L.	450·0	443·2	..	385·4	376·0	364·0	..	..	..	235·2	224·2	..	..	..	..	..	..	..	..
598	♂	R.	466·7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	470·0	464·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Q Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length	Breadth	Length.	Breadth	Infra-spinous length.
601	?	R.	..	..	..	..	..	351·4	..	311·0	309·0	..	..	..	..	..	..	..	..	..	..
607	?	R.	..	..	..	..	..	..	379·0	..	..	..	..	..	..	..	..	..	..	..	..
610	♀	R.L.	l 395·3	l 392·0	l 59·5	l 364·0?	l 355·3?	l 344·0?	..	r 294·6	r 290·2	..	..	..	..	..	..	..	..	..	..
615	?	R.	..	..	..	..	..	..	..	..	..	237·9	226·6	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	297·8	295·6	238·4	225·7	..	250·7	..	..	..	..	..	..
631	♀	R.	422·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	423·2	417·3	63·1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
656	?	R.	..	..	..	350·5	342·0	327·0	343·9	..	..	..	..	..	..	..	..	..	..	..	..
		L.	422·0	417·6	..	350·3	342·0	326·5	..	..	..	..	..	..	..	..	..	..	..	..	..
666	?	—	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89·4	108·8	..	..	..
673	♂	R.	407·0	405·1	67·9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	410·9	407·1	..	335·6	327·7	315·0	..	..	..	..	..	..	..	..	..	..	..	..	..
686	♀	R.	382·3	377·5	..	..	..	..	..	263·0	261·3	..	..	..	..	119·0	86·3	98·3	..	..	..
		L.	..	..	..	..	..	..	..	256·2	253·5	..	..	..	..	119·4	..	..	..	..	..
686A	?	L.	423·8	420·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
693	?	R.	414·2	406·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
766	?	R.	..	..	..	363·8	353·7	340·2	..	..	..	233·0	219·5	258·6	254·0	..	..	..	..	..	..
		L.	431·1	425·2	..	361·5	351·2	338·5	..	..	..	..	..	256·0	252·0	..	..	..	..	..	..
797	♀	R.	363·4	360·5	..	..	..	..	..	272·4	270·0	..	..	..	..	131·1	..	..	..	..	..
		L.	..	..	..	..	..	..	..	266·3	263·4	..	..	227·0	224·0	..	..	..	..	..	..
806	♂	R.	460·0	455·0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	461·1	458·4	..	393·0	383·5	367·0	..	..	..	..	..	..	..	..	..	..	..	..	..
865	♀	R.	383·0	..	..	310·0	301·8	289·0	..	268·8	265·9	..	..	227·3	222·4	123·7	..	..	..	..	..
		L.	383·0	382·0	60·0	313·0	305·2	292·0	..	262·1	257·6	..	..	226·6	220·6	123·7	..	..	..	..	..
908	?	R.	..	..	..	390·4	380·1	363·3	..	..	..	..	..	..	..	..	..	..	..	..	..

Q Graves.—*Non-skeletons.*

Q (bones without numbers). F.r. 469·3, 467·9; 447·2, 440·8. F.l. 482·4, ——; 468·0, 464·8; 447·0, 443·2. T.r. 366·4, 357·8, 344·3; 346·0, 338·3, 323·0. T.l. 369·2, 359·5, 346·8. H.r. 352·8, 352·4; 312·4, 312·0; 308·0, 303·6; 294·2, 292·3. H.l. 296·6, ——. R.l. 263·0, 249·8; 259·0, 250·0. U.r. 248·0, 243·3. U.l. ——, 277·0; ——, 232·5. Sacrum 101·0, 111·5.

Q 83. T.r. ——, ——, 374·0.
Q 109. F.l. 426·4, 423·0.
Q 176B. F.l. 466·0, ——.
Q 212. U.l. ——, 276·3.
Q 212–1. R.l. ——, 246·8; Cl.l. 158·1.
Q 252. H.l. 299·8, ——.
Q 324. H.l. 296·0, 292·0.

Q 359–3. F.r. 448·0, 442·3; F.l. 451·6, 445·8.
Q 377. T.l. 381·3, 371·0, 358·5; Sacrum 116·0, 111·3.
Q 482. F.l. 449·0, 445·2, 74·5.
Q 528. F.r. 415·5, 413·4.
Q 598. F.l. 472·3, 471·4.

B Graves.—*Skeletons.*

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maxi-mum.	Ob-lique.	Neck.	Maxi-mum.	Ex-cluding spine.	Centre to centre.	Maxi-mum.	Maxi-mum.	Ob-lique.	Maxi-mum.	Centre to centre.	Maxi-mum.	Ex-cluding styloid.	Maxi-mum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
2	♂	R.	419·5	412·0	..	349·3	341·5	329·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	422·3	415·3	..	354·0	347·0	334·5	..	..	..	..	..	..	..	..	..	..	..	..	..
2x	♂	R.	447·8	446·5	76·2	376·0	366·3	351·2	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	445·3	445·0	..	374·4	364·8	349·3	..	?300·2	?300·1	..	..	..	..	..	..	..	..	..	..
3	?	R.	..	..	..	370·2	358·8	342·0	..	..	..	..	..	..	..	..	..	..	..	..	..
4	?	L.	..	..	..	378·3	371·8	358 0	..	..	..	..	..	..	..	..	..	..	..	..	..
5	♂	R.	..	..	..	392·0	381·8	364·6	..	315·3	312·0	253·3	241·0	..	..	..	..	..	..	..	..
		L.	..	..	..	391·7	382·0	366·2	..	314·0	307·1	..	..	277·0	273·4	..	..	..	..	..	..
8	♂	R.	..	..	..	391·4	384·0	370·7	..	..	..	..	..	..	..	..	104·0	104·3	..	..	..
		L.	442·2	441·0	69·1	370·3	357·3	342 6	354·5	..	..	247·2	233·0	261·3	258·6	..	..	..	..	..	..
9	?	R.	..	..	..	362·0	352·2	337·8	347·5	..	..	..	..	..	..	..	..	..	..	..	..
10	♂	L.	478·3	476·0	..	411·0	400·0	384·2	..	..	..	..	..	..	..	..	..	..	..	..	..
12	♂	R.L.	r 451·8	r 445·4	..	l 392·0	l 382·0	l 366·0	l 359·8	..	..	l 260·4	l 248·0	r 279·0	r 273·0	..	93·2	109·6	..	125·0	111·0
12b	?	R.	444·5	441·8	..	379·8	370·2	355·7	..	..	..	..	..	..	..	..	..	..	..	..	..
14	♀	R.	436·0	433·2	64·2	367·1	358·6	345·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	437·0	435·5	64·5	373·8	364·3	351·3	..	..	..	233·6	221·2	..	..	..	..	..	..	..	..
15a	?	R.	430·3	479·4	72·3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15ab	♂	R.	..	..	..	418·0	409·2	392·0	..	..	..	270·2	255·3	288·0	281·2	..	101·3	117·3	..	..	..
		L.	..	..	..	417·0	407·1	392·0	..	338·3	336·8	269·8	254·8	..	..	..	..	..	..	..	..
18	♀	R.	407·7	403·0	62·8	..	..	321·3	..	..	..	..	..	..	235·2	..	..	..	..	..	..
		L.	409·3	405·2	62·0	345·0	335·0	322·8	..	..	..	..	..	233·2	229·2	..	..	..	..	..	..
19	♂	R.	459·8	457·3	79·7	384·3	374·0	358 0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	385·0	373·3	357·2	..	..	..	..	..	..	..	..	..	..	..	..	..
21	♀	R.	438·4	432·0	..	363·8	356·0	344·1	..	316·8	314·3	248·2	236·3	..	..	..	..	..	..	..	..
		L.	434·0	427·0	..	..	..	..	..	309·0	306·8	..	..	..	..	..	..	..	..	..	..
22	♂	R.L.	r 500·8	r 499·6	..	l 434·8	l 424·3	l 409·7	..	l 336·4	l 335·3	..	..	..	..	..	105·6	114·7	..	..	..
23a	♀	R.	..	..	..	356·8	347·3	333·4	..	300·0	297·4	232·2	220·3	253·1	249·1	..	..	..	..	..	..
		L.	419·2	414·9	..	..	..	..	..	291·0	287·2	..	..	247·2	242·6	..	..	..	..	..	..
24D	?	L.	..	..	..	..	..	..	..	319·5	315·4	..	..	..	..	..	..	..	..	..	..
27	?	R.	..	..	..	382·9	373·7	363·0	..	..	..	..	..	..	..	..	..	..	..	..	..
29	?	R.	..	..	..	359·0	349·5	339·4	..	..	..	..	..	..	..	..	..	..	..	..	..
30	♂	R.	..	..	..	..	..	..	..	..	..	253·2	240·0	..	270·3	148·3	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	..	..	..	..	149·4	..	..	..	..	..
31	♂	R.L.	..	..	..	..	..	..	l 394·0	l 340·0	l 331·4	l 268·0	l 260·8	..	..	r 161·0	..	..	..	..	..

B GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
34	♀	R.	..	..	..	..	..	..	..	299·3	294·1	238·4	226·5	255·8	253·4	..	..	..	..	..	..
		L.	..	..	..	364·5	355·8	343·0	..	..	..	..	..	250·4	247·7	..	..	..	..	..	..
35	♀	R.	436·0	433·8	..	370·5	363·2	350·6	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	432·3	430·8	66·3	..	..	348·2	..	..	..	..	..	..	..	..	..	..	..	..	..
36	♀	R.	449·8	443·8	66·0	363·2	353·3	338·3	350·2	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	366·0	356·2	341·3	354·3	289·0	286·5	..	..	258·3	254·0	..	..	..	..	..	..
37	♀	R.	415·0	411·0	64·4	356·0	346·0	333·0	..	..	..	236·0	223·0	..	..	..	..	..	..	..	..
		L.	417·0	413·0	63·1	..	..	332·0	347·0	290·8	288·2	..	..	..	..	..	..	..	..	..	..
38	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	144·7	89·3	114·8
39	♀	R.	..	..	..	338·0	330·0	316·5	..	283·0	279·2	..	..	..	..	141·2	..	..	..	..	..
		L.	..	..	..	..	..	..	..	279·0	274·0	220·8	210·7	..	..	..	..	..	..	..	..
44	?	R.	428·3	423·5	..	367·2	358·4	343·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	429·8	425·6	..	367·3	358·1	343·7	..	290·0	289·4	..	..	..	..	..	..	..	..	..	..
47	♂	R.	..	..	..	..	..	..	..	321·5	316·2	..	..	..	..	..	87·0	104·4	..	96·4	119·4
48	♂	R.	..	..	..	428·0	416·4	398·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	398·0	..	339·5	335·2	..	..	..	..	..	..	..	..	..	..
49	♂	R.	473·0	468·9	..	..	..	..	..	322·3	317·5	..	..	..	..	147·0	..	..	..	..	..
		L.	478·5	476·0	..	416·3	406·5	389·8	..	323·4	317·2	..	..	285·0	282·0	..	..	..	..	..	..
50*a*	♀	R.	..	..	..	..	..	322·7	339·2	290·4	289·0	..	..	..	..	..	..	..	..	..	..
		L.	428·0	422·6	69·1	347·0	338·0	324·5	339·7	..	..	218·4	206·0	242·0	237·3	..	..	..	..	..	..
50*c*	♀	R.	428·0	424·8	63·0	367·2	356·1	342·0	..	288·1	288·1	233·0	217·0	..	..	142·2	..	..	..	..	..
		L.	422·0	419·8	..	364·7	353·7	340·2	..	283·2	282·7	229·5	213·7	256·1	249·5	143·8	..	..	..	..	..
51	♀	R.	434·9	428·2	63·6	..	..	..	354·1	..	..	..	..	..	..	..	..	..	..	..	..
		L.	436·5	432·2	64·7	366·0	357·0	345·0	..	..	..	..	..	..	..	..	..	..	..	..	..
53	♀	R.	403·3	402·8	62·8	336·0	326·5	313·4	..	288·6	287·0	..	..	..	..	130·1	..	..	..	..	..
		L.	403·4	403·8	66·0	341·2	330·9	319·4	329·0	288·3	288·0	227·0	215·3	..	..	..	..	..	..	..	..
61	?	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	164·0	..	..	..	..	..
62	?	R.	433·4	430·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
67	♀	R.	424·8	420·2	65·5	367·0	358·8	344·7	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	368·2	360·3	347·2	360·2	..	..	..	..	..	..	..	..	..	..	..	..
70	♀	R.	..	..	..	377·2	369·0	355·0	..	..	..	..	235·8	..	..	..	..	..	..	..	..
		L.	..	..	..	379·9	370·5	357·3	..	..	..	..	..	..	..	..	..	..	..	..	..
72	♂	R.L.	*l* 460·0	*l* 460·3 (—)	..	*r* 399·5	*r* 389·4	*r* 372·2	..	..	..	..	..	..	..	..	..	..	..	..	..
73	?	R.	..	..	..	363·0	350·8	333·5	..	..	..	..	..	..	..	..	..	..	..	..	..

B GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicl. Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infra-spinous length.
73	?	L.	..	..	..	..	..	433·8	350·3	293·9	292·8	..	..	..	..	..	..	..	..	..	..
74	♂	R.	468·0	465·2	..	405·1	393·0	377·3	..	..	..	..	..	..	..	..	92·3	109·7	..	..	..
		L.	475·8	474·6	..	410·0	398·3	383·2	392·6	..	..	..	..	..	..	..	..	..	..	..	..
76	♀	R.	..	..	..	341·3	331·1	314·9	..	..	..	231·0	216·4	254·0	246·3	..	105·0	107·2	..	..	..
		L.	422·0	416·6	64·3	340·0	328·9	314·0	..	..	..	229·0	214·0	251·0	242·4	..	..	..	..	..	..
77	♀	R.	..	..	..	..	..	..	..	279·5	279·0	..	..	234·0	229·0	..	..	..	..	..	..
		L.	396·3	394·8	55·4	334·0	324·1	312·1	..	..	..	..	..	229·8	226·0	..	..	..	..	..	..
78	♀	R.	402·3	398·2	58·7	..	..	317·7	..	..	..	220·5	209·4	243·0	238·4	..	94·5	111·1	..	..	..
		L.	405·2	400·8	58·6	342·0	331·9	319·0	..	279·0	278·0	221·0	209·0	242·1	239·7	..	..	..	..	..	..
80	?	R.	..	..	..	390·2	380·9	366·4	..	..	..	..	..	..	..	..	..	..	..	..	..
83	♂	L.	..	..	..	..	..	..	382·6	..	..	..	..	..	..	..	..	..	..	..	..
84	♂	R.	436·8	431·0	..	363·6	354·2	339·0	351·0	308·3	304·2	..	..	..	..	..	..	..	..	..	..
		L.	438·0	432·4	62·6	367·7	359·0	344·0	..	..	..	..	..	..	..	..	..	..	..	..	..
86	♂	R.	..	..	..	..	..	..	..	320·0	319·0	257·0	242·8	..	..	149·0	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	253·0	237·0	274·0	268·0	..	..	..	..	..	..
90	♀	R.	..	..	..	361·8	354·2	339·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	362·5	354·2	339·5	..	277·4	275·8	..	..	..	..	..	..	..	..	..	..
94	♀	R.	465·0	461·0	..	..	..	376·2	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	401·5	392·0	376·5	..	326·3	322·3	..	..	..	261·0	..	..	..	..	..	..
95	?	R.	..	..	..	397·3	389·0	375·3	..	..	..	..	..	..	..	..	..	..	..	..	..
97	?	L.	..	..	..	..	..	..	..	272·2	271·1	..	..	..	..	..	..	..	..	..	..
100	♀	R.	422·2	418·5	63·6	363·0	355·0	342·3	..	..	..	232·5	222·3	255·2	250·4	138·4	..	..	..	..	..
		L.	..	..	..	364·0	355·5	342·2	..	297·0	295·2	234·1	223·0	..	..	..	..	..	..	..	..
105	?	L.	..	..	..	361·0	350·6	332·0	..	..	..	..	..	..	..	..	..	..	..	..	..
105A	?	R.	..	..	..	..	..	..	406·5	..	..	255·3	241·7	..	..	..	..	..	..	..	..
106	♂	R.	459·3	..	..	389·3	380·0	364·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	457·2	456·0	70·9	391·2	381·0	366·2	..	323·0	322·0	255·0	239·1	..	..	162·4	..	..	..	..	..
107	?	R.	..	..	..	380·2	370·4	357·0	363·5	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	388·7	379·2	362·3	367·0	317·2	316·3	..	..	..	..	..	..	..	..	..	..
108	♀	R.	402·6	396·3	61·5	348·7	342·0	329·3	332·1	..	..	230·2	217·2	..	..	..	..	..	..	..	..
		L.	402·4	397·2	59·7	353·7	344·7	332·3	..	292·6	291·3	..	..	248·0	245·0	137·8	..	..	..	..	..
109	♀	R.	..	..	..	372·4	364·2	350·2	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	374·0	364·2	350·0	359·3	..	..	..	..	..	..	..	..	..	..	..	..
110	♂	R.	..	..	..	391·0	381·3	369·0	..	332·5	329·7	..	..	285·3	280·4	..	..	..	..	..	..

B GRAVES.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
110	♂	L.	450·1	448·2	70·2	392·3	382·0	369·2	..	334·4	333·0	262·0	248·5	284·0	278·7	161·2	..	..	..	..	..
111	♀	R.	..	..	..	..	..	..	352·0	300·2	297·1	240·0	227·2	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	353·6	291·6	290·0	236·3	224·0	258·6	251·0	..	..	..	..	..	..
112	♀	R.	399·0	392·0	..	339·4	331·0	317·8	322·0	279·0	278·1	..	..	244·0	236·7	..	103·9	98·8	..	..	..
		L.	392·6	385·1	60·0	338·0	330·2	317·5	..	271·8	271·1	217·0	204·5	242·1	233·8	123·4	..	..	..	..	..
113	♂	R.	477·8	472·0	..	418·0	408·7	392·3	..	340·7	331·0	270·4	257·5	293·8	290·3	..	..	..	174·2	99·6	133·0
		L.	..	..	..	416·0	405·0	391·0	..	337·0	327·3	267·3	254·0	290·3	286·0	..	..	..	168·0	101·3	127·3
114	♂	R.	..	..	..	..	..	..	..	309·7	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	333·2	..	300·9	299·2	238·3	225·4	264·0	258·0	135·4	..	..	147·3	95·0	112·8
115	♂	R.	453·0	452·4	67·4	383·2	374·3	360·3	..	319·0	317·8	249·3	235·6	275·0	269·0	151·1	..	..	..	106·1	107·5
		L.	..	..	..	..	..	..	..	313·0	310·9	..	..	..	..	151·0	..	..	..	..	..
116	♀	R.	415·0	..	..	352·5	344·3	332·3	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	417·0	410·9	59·9	354·2	344·3	333·0	..	..	..	..	..	..	..	..	..	..	..	..	..
117	♀	R.	..	..	..	..	..	..	341·1	290·8	289·7	..	..	..	..	..	92·0	103·9	..	..	..
		L.	..	..	..	..	..	..	347·2	286·0	285·3	..	..	..	..	..	..	..	..	..	..
118	♀	R.	450·3	449·3	81·3	382·5	372·8	359·5	..	341·2	340·2	259·4	245·4	..	..	..	..	..	..	..	..
		L.	460·5	459·0	..	385·7	375·8	363·5	..	..	..	..	..	..	..	..	..	..	..	..	..
119	?	L.	..	..	..	..	..	..	..	287·0	284·2	..	..	..	..	..	..	..	..	..	..
119A	♀	R.	..	..	..	..	..	..	..	290·7	288·1	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	..	..	237·8	226·5	..	..	..	..	..	..	..	..
119*b*	♂	R.	477·8	473·3	75·6	397·0	388·0	373·2	..	332·2	331·6	258·0	242·0	..	276·5	149·3	..	..	..	..	..
		L.	..	..	..	..	..	..	..	329·0	324·8	..	..	277·8	273·2	..	..	..	..	..	..
119*c*	♀	R.	..	..	..	357·0	349·5	334·2	..	..	..	226·3	212·5	250·4	242·1	123·6	..	..	..	..	..
		L.	437·0	435·0	..	356·3	346·7	333·0	..	299·0	297·3	..	..	247·3	241·0	..	..	..	131·0	89·8	105·0
120	♀	R.	430·5	428·0	..	355·0	347·0	334·6	339·5	..	..	222·1	210·5	247·6	243·4	..	97·6	98·3	..	..	..
		L.	431·3	429·0	60·5	360·3	352·1	340·0	346·3	?309·0	?306·2	217·8	207·0	242·3	238·2	137·5	..	..	..	88·6	101·8
121	♀	R.	..	..	..	372·0	363·1	347·8	..	300·0	297·0	..	..	..	..	132·7	91·2	110·0	..	90·8	106·9
		L.	?412·2	?407·0	..	367·0	359·4	345·3	..	291·5	289·2	235·2	223·2	260·3	253·0	134·2	..	..	..	..	..
122	?	R.	432·2	426·3	..	..	..	..	..	..	..	242·0	238·0	..	260·4	143·7	..	..	..	..	..
		L.	427·0	424·4	..	361·0	350·6	337·2	..	..	..	..	..	259·3	253·0	..	..	..	..	..	..
128	♀	R.	431·0	420·0	63·8	360·2	352·2	338·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	434·6	429·3	..	362·3	352·8	340·3	351·4	296·8	296·2	..	..	..	..	..	..	..	..	..	..
130	♀	R.	438·2	432·0	64·5	367·9	358·3	344·0	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	..	..	..	365·4	357·0	343·0	..	..	..	..	..	..	..	..	..	..	..	..	..

B Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infraspinous length.
131	♂	R.	453·1	451·9	71·6	396·0	386·7	374·5	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	454·0	453·3	..	394·0	385·2	372·3	377·5	327·0	325·3	256·0	242·1	..	269·8	142·8	..	..	..	..	..
132	♂	R.	..	..	..	397·8	389·0	375·3	..	..	..	276·8	261·0	..	..	143·2	..	..	..	99·6	117·0
		L.	457·8	455·5	..	399·9	390·2	377·6	..	..	..	..	..	294·0	290·3	153·2	..	..	..	..	..
133*a*	?	?	..	..	..	400·0	390·8	376·8	..	..	..	..	..	..	..	..	..	..	..	..	..
134	?	R.	..	..	..	397·8	387·7	372·4	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	472·7	468·0	67·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

B Graves.—*Non-Skeletons.*

B. T.r. 397·5, 386·3, 374·0; T.l. 399·0, 390·5, 374·0.

B 2. F.l. 476·0, ——.

B 12. T.l. 365·0, 353·7, 338·0. H.r. 342·0, 338·8. H.l. 316·4, 313·0; 304·5, 303·2. R.l. 250·3, 235·5.

B 21. H.l. 294·5, 293·6.

B 83. F.r. 448·5, 446·0, 68·6; 447·8, 447·1. F.l. 455·3, 454·9, 69·9; 445·3, 443·2, 67·0. T.r. 393·6, 383·2, 368·0. T.l. 394·2, 382·3, 368·0, 377·0, 367·6, 353·2.

B 86. F.r. 461·3, 456·2, 70·9; 458·3, 455·1. F.l. 463·3, 461·4, 70·7; 462·0, 458·3, 73·6. T.r. 408·0, 398·6, 383·7; 392·3, 384·2, 371·0. T.l. 406·2, 398·0, 384·0; 394·0, 386·4, 372·3.

B 90. F.r. 410·6, 408·2, 61·4; F.l. 409·1, 406·0, 63·5.

B 105. F.l. 523·4, 521·0; 498·1, 493·5. T.r. 363·9, 354·0, 335·0. T.l. 425·0, 414·6, 399·1.

B 105A. T.r. 420·8, 411·3, 396·2.

B 107. F.r. 437·2, 435·0; F.l. 439·5, 436·2, 68·5.

B 111. F.r. 453·4, 447·5, 61·0. F.l. 452·3, 448·3, 59·1; 417·5, 413·3, 63·0. T.r. 376·0, 368·0, 355·1; 358·0, 351·4, 336·8. T.l. 381·3, 372·4, 360·4; 354·7, 348·3, 334·8.

B 117. T.r. 353·4, 344·3, 333·3; 349·8, 342·8, 330·8. T.l. 354·8, 346·7, 336·0.

T GRAVES.—*Skeletons.*

No.	Sex.	Side.	Femur. Maximum.	Femur. Oblique.	Femur. Neck.	Tibia. Maximum.	Tibia. Excluding spine.	Tibia. Centre to centre.	Fibula. Maximum.	Humerus. Maximum.	Humerus. Oblique.	Radius. Maximum.	Radius. Centre to centre.	Ulna. Maximum.	Ulna. Excluding styloid.	Clavicle Maximum.	Sacrum. Length.	Sacrum. Breadth	Scapula. Length.	Scapula. Breadth	Scapula. Infraspinous length.
2	?	R.L.	..	..	..	..	..	..	..	r342·5	r340·9	l260·5	l246·0	..	..	r177·0	..	..	..	..	..
4c	♂	R.	426·8	425·7	68·8	371·1	364·0	351·0	353·0	..	..	246·5	231·0	272·2	263·0	..	..	..	..	..	..
		L.	426·2	425·2	71·4	367·8	359·0	346·5	357·0	..	..	..	..	..	..	..	..	..	..	..	..
5E	♀	R.	444·6	440·8	57·2	375·0	367·0	352·8	362·0	296·2	292·0	240·3	229·3	..	..	144·2	..	..	..	91·8	95·0
		L.	444·8	441·0	62·9	378·0	371·2	357·0	..	291·1	285·0	239·5	228·0	260·2	254·0	..	..	..	..	94·2	97·1
5F	♀	L.	..	..	..	..	..	..	..	..	..	..	..	272·0	269·2	..	..	..	..	..	..
6	♀	L.	..	..	..	347·0	337·4	326·2	..	..	..	..	..	250·0	247·6	..	101·1	107·4	..	..	..
7	♀	R.	385·0	384·0	60·2	..	..	..	307·0	..	..	216·0	204·4	..	..	..	..	..	..	..	..
		L.	..	..	..	333·4	323·5	311·2	..	288·2	284·3	..	..	..	234·8	..	..	..	..	..	..
10	♂	R.	..	..	..	..	..	400·8	..	346·3	341·8	..	260·0	288·9	285·0	169·0	..	..	..	110·3	119·4
		L.	496·2	489·8	77·1	..	..	401·5	406·0	346·2	342·4	..	261·0	..	..	161·2	..	..	..	111·3	121·5
15	♂	R.	..	..	..	..	..	..	..	..	..	..	..	..	..	161·2	..	..	..	..	..
15E	?	R.	462·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	487·2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	♀	R.	433·2	430·4	66·1	361·2	350·9	336·0	348·0	301·8	299·3	237·0	222·3	257·0	250·0	..	100·3	115·8	..	..	..
		L.	438·2	434·2	67·3	359·8	349·0	336·8	352·0	297·1	295·7	235·0	219·8	254·3	249·0	148·0	..	..	..	95·3	100·9
17	♀	R.L.	r428·0	r424·3	r64·5	r356·0	r346·0	r332·5	..	l289·3	l286·9	r226·2	r214·5	..	l241·8	..	93·2	109·8	..	..	..
18	♀	R.	..	..	..	..	..	..	..	312·2	312·2	234·5	221·7	..	..	..	97 8	117·5	..	..	..
		L.	..	..	..	..	..	..	..	304·2	304·2	..	..	251·3	247·4	145·0	..	..	..	..	..
19	♂	R.	428·3	427·2	71·1	366·0	358·2	345·0	361·8	303·2	302·8	..	..	273·2	265·7	..	93·3	111·2	..	..	..
		L.	423·5	421·2	69·5	365·0	356·4	342·5	..	293·8	293·0	245·4	233·0	270·2	262·5	..	..	..	..	..	..
20	♀	L.	..	..	..	343·3	334·0	322·0	..	..	..	..	..	..	..	..	..	..	..	..	..
21	♂	R.	463·6	..	..	379·0	367·8	355·8	..	..	..	..	..	..	..	155·6	..	..	150·4	99·0	112·2
		L.	..	..	..	..	..	..	367·0	..	..	..	..	..	..	..	..	..	150·2	101·3	113·8
25	?	R.	..	..	..	..	..	..	..	..	..	..	..	270·5	266·0	..	..	..	..	..	..
26	♂	R.	472·3	469·0	..	402·0	391·8	377·0	382·5	..	..	..	..	..	..	..	..	..	..	..	..
		L.	471·8	469·8	..	404·4	395·8	381·2	..	..	..	..	..	..	..	..	..	..	..	..	..
29	♀	R.	..	..	..	..	..	..	..	289·0	..	228·0	216·0	..	..	..	..	..	..	..	..
30	♂	R.	503·0	499·5	..	415·4	407·6	392·5	399·0	354·0	350·8	284·8	272·0	314·0	308·3	..	..	..	..	..	..
		L.	499·0	497·0	82·9	418·4	408·0	394·8	400·2	347·8	346·8	282·7	269·0	306·5	302·5	..	..	..	..	..	..
35	♀	R.	484·8	479·2	..	407·3	396·6	384·6	394·0	..	..	..	..	..	..	..	..	..	..	..	..
36	♂	R.	457·2	453·3	67·7	..	..	..	372·0	..	..	..	..	..	..	..	..	..	..	..	..
		L.	457·5	454·8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37	♂	R.	..	..	..	..	..	351·3	..	..	..	259·3	244·2	282·8	277·0	164·3	..	..	..	..	..

T Graves.—*Skeletons* (continued).

No.	Sex.	Side.	Femur.			Tibia.			Fibula.	Humerus.		Radius.		Ulna.		Clavicle	Sacrum.		Scapula.		
			Maximum.	Oblique.	Neck.	Maximum.	Excluding spine.	Centre to centre.	Maximum.	Maximum.	Oblique.	Maximum.	Centre to centre.	Maximum.	Excluding styloid.	Maximum.	Length.	Breadth	Length.	Breadth	Infra-spinous length.
37	♂	L.	..	..	..	..	..	..	..	326·0	322·0	259·5	244·4	283·0	276·2	..	..	..	..	..	..
39	♀	R.L.	l 430·0	..	..	..	..	..	..	l 299·5	l 296·3	r 234·0	r 221·8	..	..	..	101·3	105·3	..	..	..
40	♂	R.	474·4	473·2	..	394·0	384·0	371·3	..	..	..	..	..	..	..	..	116·1	114·6	..	..	..
		L.	475·2	472·3	..	394·8	384·9	373·0	382·0	..	..	..	..	..	..	..	..	..	..	..	..
41	♀	R.	..	..	..	..	..	..	380·3	..	..	262·0	249·2	..	..	148·4	99·6	110·4	..	..	..
		L.	..	..	..	..	..	..	382·0	330·3	328·0	262·0	248·1	..	281·1	..	..	..	..	..	..
43	♀	R.	399·2	392·7	61·8	..	..	..	320·8	284·0	282·0	..	..	244·0	240·0	..	..	..	..	..	..
		L.	..	..	..	..	..	..	..	276·3	273·2	..	..	240·3	238·0	..	..	..	..	..	..
52	?	R.	484·0	..	..	402·0	392·0	379·4	390·0	340·2	338·2	..	..	..	..	..	..	..	..	..	..
54	♀	R.	403·1	396·5	..	340·9	332·3	319·0	334·0	290·4	289·0	..	..	..	..	121·4	..	..	..	..	..
		L.	403·7	397·0	..	344·3	334·4	321·3	334·0	284·9	284·0	223·0	210·4	244·1	240·0	..	..	..	..	..	..
55	♀	R.	460·0	455·2	..	388·2	378·6	364·7	370·3	319·5	317·0	249·5	235·0	..	..	..	..	..	..	..	..
		L.	460·0	456·3	..	388·5	378·0	365·5	..	..	..	..	..	..	..	154·9	..	..	..	..	..
56	♀	R.	420·6	416·0	..	364·0	354·2	340·1	349·0	314·0	311·0	..	..	260·5	254·0	..	..	..	137·8	95·2	98·3
		L.	..	..	..	364·0	354·6	341·4	..	306·2	305·2	241·8	230·0	260·7	255·3	..	..	..	..	95·8	96·0
57	♂	R.	464·3	462·0	76·0	392·0	382·5	365·8	372·0	322·6	315·3	241·6	226·8	..	..	156·0	..	..	..	..	..
		L.	..	..	..	392·3	382·4	366·0	374·0	..	..	241·0	225·5	263·2	256·3	..	..	..	..	..	..
58	♀	R.	428·3	424·0	66·6	343·8	333·6	320·6	..	..	..	..	..	..	..	..	..	..	..	..	..
		L.	423·2	418·0	..	346·3	337·0	324·4	333·4	285·1	284·0	..	..	..	..	..	..	..	..	..	..
59	♀	R.	437·0	436·0	65·6	369·3	359·0	343·0	253·2	317·0	313·4	243·2	231·2	269·8	261·0	..	..	..	..	..	..
		L.	443·7	441·2	..	370·0	360·0	345·4	..	310·3	306·3	239·3	225·3	263·0	255·0	..	..	..	137·4	98·9	105·2

T Graves.—*Non-Skeletons.*

T 4. F.r. 468·2, 462·4, 75·4. F.l. 470·3, 461·4, 74·7; 446·0, 444·5, 70·5. T.r. 386·0, 377·9, 365·0; 370·5, 363·0, 347·5. T.l. 399·8, 389·4, 374·3; ——, 362·3, 348·2. Fib.l. 379·8; 361·5.

T 17. H.l. 329·0, 326·4.

Description of Plate 22.

Figs. 1–6 indicate the various measurements made on the different bones.

Fig. F.l. 235 is the outline of a cross-section through the middle of the shaft of a pilastric femur. It resembles an isosceles triangle, and is the rarer type.

Fig. F.r. 175. This is the commoner type where the crest is rectangular in cross-section.

Fig. F.r. 7 (1). A similar cross-section through a femur with a low pilastric index.

Fig. F.r. 7 (2). A sub-trochanteric section through the same femur, showing the antero-posterior flattening (platymerism), and the third trochanter indicated by *.

Fig. F.r. 1612. A sub-trochanteric section through a less pronounced platymeric femur.

Figs. T.r. T 40 and T.r. 382 are cross-sections through strongly platycnemic tibiæ. In T.r. T 40 the posterior surface has disappeared, while this is not the case in T.r. 382. The sections were taken at the level of the anterior nutritive foramen.

Fig. Fib.l. B 107. Cross-section through a channelled fibula.

Fig. U.r. B 114. An outline of an incurved ulna.

Fig. S. 1102 exhibits the curvature of a sacrum composed of six vertebræ and possessing two promontories owing to the imperfect assimilation of the first vertebra.

Figs. S. 1212 and S.B. 112. These indicate the extremes which were observed in the curvature of the sacrum. S. 1212 is a male sacrum, and S.B. 112 is a female sacrum.

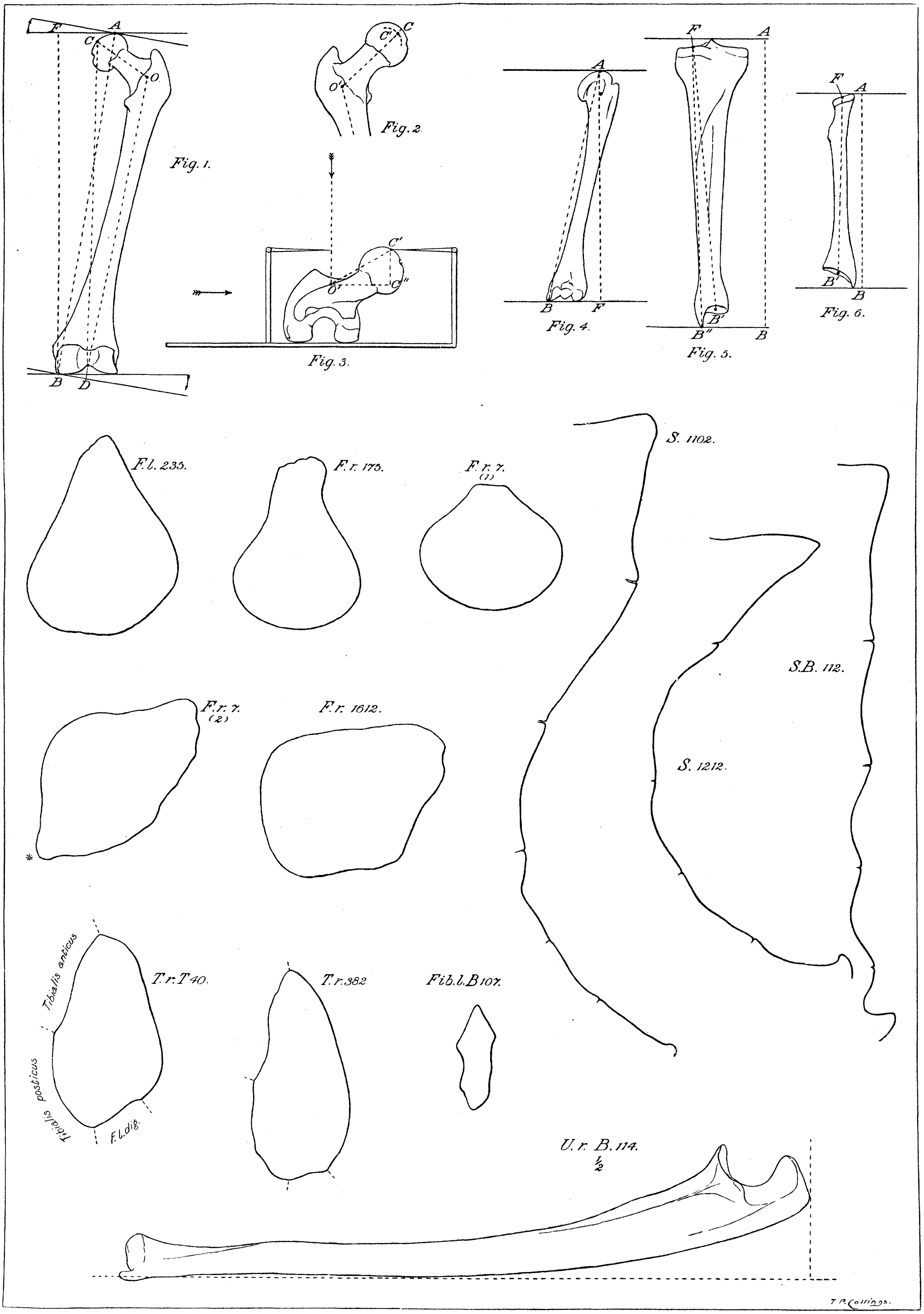


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
F.l. 235.
F.r. 175.
F.r. 7. (1)
S. 1102.
F.r. 7. (2)
F.r. 1612.
S.B. 112.
S. 1212.
Tibialis anticus
Tibialis posticus
F.l.dig.
T.r.T40.
T.r.382
Fib.l.B107.
U.r. B.114.
½
T. P. Collings.